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PREFACE.

GRATITUDE has been defined as a lively sense of favours to come, and this definition not inaptly indicates the feelings of the Editor on taking up his pen to indite a few lines by way of Preface to the volume for 1879.

Many articles of interest and value have appeared during the past year. Capt. Feilden's "Notes from an Arctic Journal," commenced in the preceding volume, have been brought to a conclusion, and furnish an excellent *resumé* of the work done by the naturalists to the last English Arctic Expedition. Mr. Ussher's "Discovery of an Ossiferous Cavern in Waterford," and the account which he has given of the animal remains brought to light there, will be very acceptable to palæontologists. Dr. Murie's instructive article "On Nocturnal Animals," with illustrations of some of the more singular forms, deals with a subject not previously dwelt upon in this journal. On the subject of British Martens, Mr. Alston's remarks (p. 441) suggest a new field of enquiry to those who may have opportunities of examining the skulls of any British-killed specimens; and while many other excellent papers have been furnished by field naturalists of the sterner sex, Miss Warren has shown by her article "On the Land and Fresh-water Shells of Mayo and Sligo" to what good account ladies may turn their opportunities, if residing in the country and possessing a taste for Natural History.

In a different field of research, Mr. Cornish has given the result of his study of a rare British Crustacean obtained on the coast of Cornwall, and now figured (p. 473) for the first time. Mr. Wolf's charming sketch of the Woodcock and young (p. 433) for truthful delineation will commend itself alike to naturalists and sportsmen.

Amongst the translations from foreign journals which have appeared in the pages of 'The Zoologist' during the past year

that by Herr Meves, "On the Change of Plumage in Birds," translated by Mr. Dresser (p. 81), is most suggestive, and is rendered all the more instructive by the two coloured plates of feathers (magnified) which accompany it. The interesting account furnished, by the Brothers Sintenis, of the breeding of the Pelican in the Danube Delta supplies a blank in the history of a species about whose nesting habits very little was known. Nor should the remarkable discovery by Dr. Dodel-Port of the fertilisation of sea-weeds by *Animalculæ* be overlooked, seeing that his illustrated article forms the first record of the participation of animals in the fertilisation of cryptogams, and furnishes an interesting parallel to the relations existing between insects and phanerogams.

But while mindful of these and other valuable communications received during the year, the Editor has nevertheless to observe with regret that 'The Zoologist' is not receiving, either from contributors or subscribers, that support which, without presumption, may be said to be due to a journal of such long standing. He has therefore earnestly to request all who feel interested in the study which it is the object of this journal to promote, to assist its circulation not only by recommending it to their acquaintance, but to aid his efforts by contributing articles to its pages. This request is made with the greater confidence because 'The Zoologist' is carried on by the proprietor, Mr. Newman, not as a source of profit, but in the interest of science, and at a loss to himself; and the Editor feels assured that he has only to make this appeal in order to receive from the many readers of 'The Zoologist' their hearty co-operation in the way which he has suggested.

On his part he promises to do all in his power to make it an efficient representative of zoological science, and especially of that part of the science which is advanced by out-door work—the observation in the field of the habits of animals. In this department he trusts that 'The Zoologist' may never fall away from the position it has taken since its first establishment in 1843; for were such to be the case it would indicate a declining interest in the most fascinating branch of Natural History.

J. E. H.

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THE NATURAL HISTORY OF PRINCE ALBERT LAND.*

By H. W. FEILDEN, F.G.S., C.M.Z.S.

I AM indebted to the courtesy of Sir Alexander Armstrong, the Medical Director of the Navy—formerly Surgeon and Naturalist on board the ‘Investigator’ during her ever memorable voyage under M’Clure to the Arctic Regions—for permission to gather, from the archives of the department under his control, the data on which the information now offered is based; unfortunately the records at my disposal are of a somewhat meagre description, consisting of a list of mammals and birds found by Mr. Anderson in Prince Albert Land between the years 1851—53: this list, however, is supplemented by a very careful inventory of the specimens collected, and brought back to England. I have been unable to trace the disposal of Mr. Anderson’s entire collection, which he states was sent to the Secretary of the Admiralty, but there is no doubt in my mind that some of the specimens are included in the Barrow Collection, now in the University Museum at Oxford, and in all probability the specimens of *Colymbus Adamsi*, and *Larus Sabinii*, included in that collection are identical with those recorded in Mr. Anderson’s list.†

The study of Natural History in the Arctic Regions is surrounded by so many difficulties that it becomes a pleasing duty to place on record the services of those men, of a former

* A Contribution to the Natural History of Prince Albert Land. Derived from the Medical Returns of the late Surgeon Robert Anderson, of H.M.S. ‘Enterprise.’

† See Harting, Catalogue of the Barrow Collection, Proc. Zool. Soc., 1871, p. 110.

generation, who, impelled only by a love for science, devoted themselves to its pursuit, under no ordinary circumstances.

Mr. R. Anderson entered the naval service in June, 1838, having received his diploma for surgery from the College of Surgeons of Edinburgh. He served from 1839 to 1842 on the Mediterranean station, and from 1843 to 1847 on the East Indian station. He was promoted surgeon, November, 1846, and served in the 'Investigator,' Captain Bird, during the Arctic Expedition of 1848—49 under Sir James Ross, and in the 'Enterprise,' Captain Collinson, from December, 1849, to May, 1855, during which commission he passed three successive winters in the Arctic Regions. He died at Edinburgh on June 24th, 1856.* The sole object of the voyage of H.M.S. 'Enterprise,' was to search for traces of the lost Franklin Expedition. How nobly that duty was performed is known to comparatively few, and only to those who have read the official journals of the Expedition, for the history of that voyage has yet to be written for the public.

The 'Enterprise,' under the command of Captain, now Admiral Sir Richard Collinson, having sailed through Behring Straits, rounded Point Barrow, the most northern promontory of Alaska, and pushing through the pack-ice gained the land-water on July 31st, 1851. Forcing his way to the eastward, by keeping close to the shores of the American continent, Collinson passed Cape Bathurst, August 25th, on which date the south shore of Banks Land was seen to the northward. The 'Enterprise,' now headed in that direction, and on August 27th, Prince of Wales Strait, the channel lying between Banks and Prince Albert Land, was entered, and by midnight of August 29th their farthest point in that direction was reached, viz., lat. $73^{\circ} 30' N.$, and long. $114^{\circ} 35' W.$, a frozen sea of a little less than sixty miles in extent separating them from the most western position gained by Parry, sailing from the eastward in 1819, and the accomplishment of the North-west Passage.

Returning southwards, a convenient harbour was found on the western shore of Prince Albert Land, in lat. $71^{\circ} 35' N.$, and long. $117^{\circ} 35' W.$: this place was given the name of Winter Cove, and there the 'Enterprise' remained, shut in by the ice, till the following year. On August 5th, 1852, the 'Enterprise' left Winter Cove and proceeded eastward along the south shore of

* For Obituary notice see Journ. R. G. S. xxvii, p. cxiii.

Prince Albert Land, and through the Dolphin and Union Strait, reaching Cambridge Bay on August 27th; there the ship took the ground, and remained until the ice set sufficiently firm to allow of the removal of everything out of the vessel to the shore; the ship floated on October 15th. The winter of 1852—53 was passed at Cambridge Bay on the south shore of Victoria Land, a position some two hundred and fifty miles farther east than that of Winter Cove.

In the spring of 1853 the sledge-parties from the 'Enterprise' searched the eastern shores of Victoria Land, for traces of the lost Franklin Expedition, singularly enough passing up the very channel in which the ill-fated 'Erebus' and 'Terror' were abandoned in 1848, and examining the opposite shore to that where in 1859, M'Clintock found the relics of the missing Expedition on King William Land. The sledge-parties returned to the ship on May 21st. On August 10th, 1853, the 'Enterprise' left Cambridge Bay, and sailing to the westward, after a perilous voyage, was detained for the winter of 1853—54, at Camden Bay, on the northern shore of the American continent, in lat. $70^{\circ} 8' N.$, long. $145^{\circ} 29' W.$ The 'Enterprise' was not able to leave Camden Bay until July 20th, 1854. Point Barrow was passed on the return voyage, August 8th; on September 16th the 'Enterprise' sailed from Port Clarence, Behring Straits, for Hong Kong.

The large island, to which the names of Prince Albert, Wollaston, and Victoria Land, have been given by successive explorers, occupies the very centre of the Parry Archipelago; it lies between the parallels of $68^{\circ} 30'$ and $73^{\circ} 20' N.$, and longitudes 100° and $120^{\circ} W.$; it is separated from the American continent by a comparatively narrow and shallow channel, varying in depth from a hundred to thirteen fathoms. If the rate of elevation continues, in these northern lands, as we are led to believe it does by the observation of recent explorers, it will only be a short time, in geological history, before Prince Albert Land and the continent of America are joined together. Roughly speaking, Prince Albert Land extends over an area of some four hundred miles east and west, and some three hundred miles north and south; the interior of this large island has not been explored.

We are well acquainted with the zoology of Melville Island

lying directly north of Prince Albert Land, through the labours of Sabine; Armstrong has given us a good insight into that of Banks and Baring Land, lying to the westward; Franklin, Richardson, and Rae have made us conversant with the faunas of the northern shores of the American continent; whilst James Ross, M'Clintock, and Walker have done the same for the land lying directly east of the area under consideration; consequently the observations of Mr. Anderson must possess especial interest for students of Arctic Zoology, as they connect the work already recorded from the north, east, and west of the Parry Archipelago.

MANMALIA.

Mr. Anderson's notice of the mammalia is confined to a list of quadrupeds ascertained by him to inhabit Prince Albert Land. This is supplemented, however, by a few references in his catalogue of specimens sent to the Admiralty. I have not in any instance altered the nomenclature as given by him, and it may be remarked that he has used the synonyms of the 'Fauna Boreali-Americana,' of Richardson and Swainson, 1829. The species are as follows:—*Lupus griseus*, *Canis lagopus*, *Mustela erminea*, *Ursus maritimus*, *Cervus tarandus*, and *Ovibos moschatus*.

Arvicola hudsonius.—A male specimen, entered in the catalogue of Mr. Anderson, was captured at Cambridge Bay, February 14th, 1853, another on March 8th, and three others during August of the same year.

Arvicola trimucronatus.—Three specimens of this Vole, all males, were captured at Cambridge Bay during the month of August, 1853. This species was observed by Sir James Ross in considerable numbers on the coast of Boothia Felix; but I am not aware that its presence has been detected on the islands to the north of the American continent by any other observer but Mr. Anderson.

Lepus glacialis.—At Cambridge Bay in January, 1853, a male Hare was killed; two young ones on June 29th and July 10th, of the same year.

AVES.

In no instance have I altered the synonymy adopted by Mr. Anderson, and it will be observed that he has used that of Richardson and Swainson in their 'Fauna Boreali-Americana,'

Aves, 1831. By keeping this in view there will be little difficulty in identifying the species designated. The memoranda at my disposal are a list of species, and a very careful catalogue of the specimens preserved and brought to England; in every instance the sex, with locality and date of capture are duly recorded by Mr. Anderson.

Falco peregrinus.—A male and female obtained at Winter Cove, June 1st, 1852.

Buteo lagopus.—Ascertained to visit Prince Albert Land. This is the most northern locality from which, so far as I am aware, *Archibuteo sancti-johannis* has been recorded, and is an addition to the avifauna of the islands north of the American continent.

Circus sp.? Doubtless *C. hudsonius*.—Noted in a similar manner as the preceding; this is likewise the most northern range recorded of the species.

Strix nyctea.—It would have been somewhat extraordinary if the Snowy Owl, so generally distributed throughout the Arctic Regions, had not been recorded from Prince Albert Land. Dall and Bannister consider it rather a rare species in the valley of the Lower Yukon.

Hirundo bicolor.—A female of this species was obtained at Cambridge Bay, May 20th, 1853. Dall and Bannister mention that it is less common in Alaska than any of the other species, though occurring from Fort Yukon to the sea.

Alda alpestris.—Two Shore Larks were obtained at Winter Cove, June 3rd, 1852. I am not aware of this species having been previously met with in the Parry Archipelago.

Linaria minor and *Linaria canescens*.—Two species of Linnet are recorded under the above names; a female bird procured at Winter Cove, April 27th, 1852, is noted as *L. canescens*. In all probability his *L. minor* is *Ægiothus linaria*, which is found in vast numbers as a permanent resident in the fur-countries. *L. canescens* was probably a Mealy Redpoll, and may have been *Ægiothus exilipes*, Coues. In the absence of the specimens to refer to, it is of course impossible to decide, but the recognition of two species by Mr. Anderson shows that he was a careful observer.

Emberiza nivalis.—A female Snow Bunting was obtained May 10th, and two males, June 5th, 1852, at Winter Cove, where the species was found breeding.

Emberiza lapponica.—Is included as another of the species visiting Winter Cove in 1852, and its nest with four eggs was procured there.

Corvus corax.—The Raven is merely recorded as one of the species ascertained to visit Prince Albert Land.

Tetrao rupestris.—The Rock Ptarmigan was observed at Winter Cove, where male and female were obtained, May 15th, 1852. On May 5th and June 10th, 1853, a male and female were shot at Cambridge Bay.

T. saliceti.—Ascertained to visit Prince Albert Land: a male bird was obtained at Cambridge Bay, May 6th; a second, May 16th; a third, May 18th; and a female, July 19th, 1853.

Grus canadensis.—A male and female of this species were killed, June 6th, 1852, at Winter Cove, where it was found breeding by Mr. Anderson, who obtained four eggs. This is the most northern breeding locality yet observed for this Crane, and I am not aware that it has been heretofore noted as nesting on the islands north of the American continent. Sir James Ross remarks that several individuals of a species of Crane were seen by him in the neighbourhood of Fury Beach, which were probably of the above-named species, but as no specimens were obtained they could not be identified with certainty.

Calidris arenaria.—At Winter Cove on June 9th, 1852, two male Sanderlings were procured,

Charadrius semipalmatus.—Two males and a female of this Ringed Plover were shot on June 9th, 1852, at Winter Cove, where the species was found breeding and the eggs procured.

C. virginicus.—The American Golden Plover was found at Winter Cove, where four male birds were obtained, June 10th, 1852; this species was found nesting at Cambridge Bay in 1853, and its eggs procured.

Vanellus melanogaster.—A male Gray Plover was procured at Winter Cove, June 11th, 1852, and a male and female at Cambridge Bay, July 14th, 1853.

Streptilas interpres.—Is recorded as breeding in the vicinity of Cambridge Bay; four specimens, two males and two females were obtained there in June, 1853.

Tringa Schinzii.—The nomenclature adopted by Mr. Anderson shows decidedly that he followed Swainson and Richardson; doubtless their work was in the library of the 'Enterprise,'

T. Schinzii of Sw. and Rich., F. B. A. ii. 1831, 384, is Bonaparte's Sandpiper, *T. fuscicollis*, Vieillot; and a reference to Mr. Dresser's 'Birds of Europe' and Dr. Elliott Coues' 'Birds of the North-West' show that little or nothing is known about its breeding haunts. It is therefore interesting to find that Mr. Anderson obtained two males at Winter Cove, June 9th, 1852; a female, June 10th of the same year, and further that he found this species breeding in the same locality, from whence he brought two eggs to England.

T. pusilla.—Two specimens of the Least Sandpiper were procured at Winter Cove, June 28th and July 6th, 1852, both being males. The eggs were found at Cambridge Bay in 1853.

T. pectoralis?—Under this name Mr. Anderson records the capture of two Sandpipers, males, on June 10th, 1852, at Winter Cove. In the absence of the specimens, however, it is not possible to say whether the species was correctly identified or not. Mr. Anderson mentions that the eggs of his *T. pectoralis* were found at Winter Cove in 1852.

Tringa sp.?—An unidentified Sandpiper was obtained at Winter Cove in June, 1852.

T. rufescens.—The Buff-Breasted Sandpiper was observed at Winter Cove, where two males and a female were procured, June 11th, 1852.

T. canutus.—A Knot, ascertained to be a female bird, was shot at Cambridge Bay, July 9th, 1853.

T. maritima.—A male Purple Sandpiper was obtained at Cambridge Bay, June 10th, 1853.

T. douglasii.—Two male Stilt Sandpipers were procured at Cambridge Bay, June 10th, 1853.

Phalaropus hyperboreus.—Two males and a female Red-necked Phalarope were procured at Winter Cove, June 15th, 1852. It was found breeding at Cambridge Bay, and the eggs were taken.

Sterna arctica.—Observed in Prince Albert Land in 1851-52, and three males and a female obtained at Cambridge Bay in July, 1853.

Larus glaucus.—This Gull was found breeding at Cambridge Bay in June, 1853, and a specimen was preserved.

L. argentatus and *L. argentatoides* are recorded by Mr. Anderson as two distinct species visiting Prince Albert Land. A female specimen of *L. argentatoides* was obtained June 11th, 1852, at

Winter Cove, where a female of *L. argentatus* was also procured the same month. Two males of the latter species were shot in July, 1853, at Cambridge Bay, where the eggs were also found. There is a further entry of three eggs of *L. leucopterus* having been procured at Cambridge Bay in 1853, but that species is not included in Mr. Anderson's list of birds. I am therefore inclined to think that the names of *L. argentatus* and *L. argentatoides* of the list should be considered synonyms for the form of Herring Gull which visits Prince Albert Land, and that *L. leucopterus* may very fairly be included as a visitor to that region.

L. Sabinii.—A male and female of Sabine's Gull were killed at Winter Cove in June, 1852, and a second pair, male and female, at Cambridge Bay in June, 1853. An egg of this species was taken at Cambridge Bay in 1853.

L. eburneus.—The Ivory Gull is simply recorded as one of the species ascertained to visit Prince Albert Land.

Lestris pomarinus.—Mr. Anderson includes in the catalogue of his collection a male of the Pomatorhine Skua. A pair were obtained at Cambridge Bay in June and July, 1853.

Stercorarius cephus.—Nos. 90 and 91 of Mr. Anderson's Catalogue are thus named, and refer to a male and female Skua obtained at Cambridge Bay, July 15th, 1853. I have no doubt that Mr. Anderson was guided in his synonymy by Swainson and Richardson (Faun. Bor. Amer., ii., 1831, p. 432), and *S. cephus* of those authors is certainly *S. crepidatus* (Gm.), Richardson's Skua.

Lestris Buffonii.—A male and female of Buffon's Skua were shot at Cambridge Bay in July, 1853.

Procellaria glacialis.—Ascertained to visit Prince Albert Land, but no specimen is included in the catalogue of the collection. It might possibly be the Pacific form *Fulmarus Rodgersi*, Cas.

Colymbus glacialis.—In all probability the form of Great Northern Diver ascertained to visit Prince Albert Land is *C. Adamsii*, Gray. A male was killed at Winter Cove, June, 1852.

C. arcticus.—Included in the list of birds of Prince Albert Land, and a male and female are recorded as procured at Winter Cove, June, 1852.

C. septentrionalis.—This bird was found breeding at Cambridge Bay, 1853.

Anser albifrons.—A male White-fronted Goose was killed at Winter Cove, June, 1852.

A. hyperboreus.—This Snow Goose was ascertained to be a visitor to Prince Albert Land. No specimen, however, is included in the catalogue of the collection.

A. Hutchinsii.—Mr. Anderson has entered this species in his list, as well as the fact of its breeding at Cambridge Bay, where he procured its eggs in 1853.

A. bernicla.—The Brent Goose is recorded as visiting Prince Albert Land. The eggs were found at Cambridge Bay in 1853.

Cygnus americanus.—Noted as visiting Prince Albert Land. Two eggs were found at Cambridge Bay in 1853.

Harelda glacialis.—Three males of the Long-tailed Duck were shot at Winter Cove in June, 1852, in which neighbourhood the eggs were also taken.

Somateria mollissima.—Although included in the list as *S. mollissima*, yet in his catalogue of specimens, Mr. Anderson adds "*var.*," so that there can be little doubt that the Eider Duck frequenting the shores of Prince Albert Land is *somateria*, *v. nigra*. Two males and two females were killed at Winter Cove in June, 1852, and two young ones were obtained at Cambridge Bay, August 6, 1853.

S. spectabilis.—Two males and one female of the King Duck were shot at Winter Cove in June, 1852, and a female at Cambridge Bay in July, 1853. The eggs were also found at Winter Cove.

NATURAL HISTORY NOTES IN HOLLAND.

By F. S. MITCHELL.

DURING the summer of 1877 and of the present year, in company with my friend Altham, I spent some five weeks in various parts of Holland. Most of the time was passed at Valkenswaard, that ornithological paradise, but the avi-fauna of this part of Brabant has been so well investigated that little occurred worth chronicling, and I do not propose to give any detailed list of the species I met with. We arrived there, last year, on the 17th May, leaving on the 4th June, and travelled back through S'Bosch by steamer down the Maas to Gorkum and Dordt, finally leaving for home on the 11th June. This year we arrived at Dordt on the 9th June, where we remained until the 15th of that month.

To the field ornithologist who prefers labelling his specimens *ipse*, there is much to disappoint in Valkenswaard, and the boys, who, at the end of one of the numerous saints-days and holidays, bring their hatfuls of eggs of Orioles, Water Rails, Spotted Crakes, and Black Terns, afford but little satisfaction in reply to enquiries concerning unidentified possible rarities.

One ought really, at a place like this, to set one's face against any payment for eggs, unless they can be shewn *in situ*. The pleasure to be derived from taking with one's own hands a single clutch is far greater than that which emanates from the possessing of some score of eggs of whose history nothing is known. At the end of a fortnight, within a reasonable distance of the village, we found only empty nests and reed-beds trampled through, and our only chance of success was to take a long walk straight away from our quarters, or travel a few stations farther on the line and work back again.

The Black Tern, *Hydrochelidon nigra*, was one of the most interesting species we met with, and its graceful evolutions enlivened many an evening's walk over the marshy moor, as we returned tired and fagged after a long day. At this time, when their mates were sitting, it was very amusing to watch them take the Field Crickets, *Acheta campestris*, as they came to the mouths of their holes for a little fresh air. These were exceedingly numerous, their chirrupings forming a continuous refrain, and were evidently a favorite food supply for the Terns. Great quickness is necessary to catch them, as they never move far from their holes, and pop in on the slightest alarm, but very few evaded the swift stoop of the bird. The first fresh eggs of this species were taken on May 21st, and numbers had begun to sit by June 3rd. Nearly all the nests had three eggs, but a few were found with only two. We were lucky in discovering several large breeding-places which the boys could not reach, and thus had ample scope for observation. These places were large pools of standing water on the open heath, with boggy bits of island here and there, and heaps of wrack kept steady by the water-grasses; a few bits of grass were collected together, and the eggs laid on them. In such situations they were high and dry, but one nest in a running stream (the only one found so) was wet through, floating partly on the surface; it was composed of a considerable quantity of water-plants, and was kept steady by some rushes bent down. Our

visits generally had to be paid early in the morning, and I cannot recommend 6 A.M. as a pleasant time for swimming about cold bogs and wandering, *in puris naturalibus*, over a floor of sharp reeds searching for eggs. We were fortunate enough once to find an old boat, half-sunk in the mud, and managed to launch it, but our appearance, with nothing on but hats and bathing-drawers, must have been an unwonted spectacle for any passers by.

It is curious to note how some nearly-allied species (only differentiated by slight variations of plumage) resemble, and in fact are identical with, each other in habits, mode of nidification, colour of eggs and song. I cannot, for instance, recognize the slightest difference in these respects between *Motacilla lugubris* and *M. alba*, *Acredula rosea* and *A. caudata*, *Cyanecula Wolfi* and *C. suecica*, though of the last I ought to say that I cannot speak positively as regards the song, my recollection of *suecica* in Norway not being good enough. The notes of the British and White-headed Long-tailed Tits are identical, as are also those of the Pied and White Wagtails, and of *Motacilla flava*, *M. viridis* and *M. Raii*.*

A nest of six eggs of Baillon's Crake, *Porzana Bailloni*, was brought to us, but these had been taken the previous year, and out of a lot of Willow Wrens I picked out the most abnormally small egg I have seen; it only measured .383 by .328 inches.

What a pity it is that such a pretty bird as the Hoopoe should have such repulsive habits, and that, in cleanliness, it should be inferior to a Jackdaw. It is the belief of the country people, a belief shared in by many of the better classes, that it builds its nest of human ordure, and any one who has ever closely approached a Hoopoe's nesting-hole, or a batch of young ones, would certainly from the stench respect the popular impression. A nest of five young, about a fortnight old, was seen

* By these last three names we presume our contributor intends to designate the Grey, the Grey-headed, and Ray's Wagtails; but as the nomenclature now stands (Yarrell's Hist. Brit. Birds, 4th ed., vol. i., pp. 552, 558, 564) they should be called *Motacilla sulphurea*, Bechstein, *M. flava*, Linnæus, and *M. Raii* (Bonaparte), in the order named. *M. viridis*, if we are not mistaken, is the Indian form of the European *M. cinereicapilla*, not to be distinguished, in our opinion, from *M. flava*. We have never experienced any difficulty in distinguishing the note of the Grey Wagtail from that of Ray's Wagtail; indeed, we have frequently been made aware of the arrival of the former bird in winter by hearing its note from the bed of a stream in which for a few moments it has been hidden from view.—ED.

22nd May, and fresh eggs were obtained up to the end of the month, so that their time of laying varies considerably.

On the 4th June, near Gorkum, we first made the acquaintance of the Great Reed Warbler, *Acrocephalus arundinaceus*, and its numbers here are extraordinary; in a twelve mile walk from Sliedrecht to Gorkum, along the banks of the Merwede, after eight o'clock at night, its curious craking notes never ceased, except as we passed through the villages. There must have been hundreds of these birds along the river. We found one nest on the 8th, containing two young, just hatched, and two eggs chipped by their occupants, but this was an exceptionally early one; and out of a dozen or more nests found in various stages, we only saw three eggs in all. In the present year, however, round about Dordt, we took numbers from the 10th to the 13th June, five eggs being the full complement. These birds appear to prefer the vicinity of the open water, and the nests are seldom placed but on borders of the reed-beds just raised sufficiently to escape the highest tides, though often so little above the surface that the bottom is in the water at each flood. They are often placed in willow forks, as well as interwoven with the reeds, and are built of water-plants, small reeds and grass, sometimes mostly of grass mixed with a little moss, the lining being of finer bits of reed and grass. The birds are very anxious and noisy if disturbed after beginning to sit, and look quite fierce as they dash about within a yard of your head, opening wide their red throats, and chiding loudly.

There are some vast reed-beds—I might almost say “reed forests”—around Dordt, tenanted by not a few Bitterns, *Botaurus stellaris*, and it was not at all uncommon, even in the middle of the day, to hear their unearthly “boom” echoing through the air; but they take up their abode in such inaccessible places that undivided attention must be given to them, if nests are to be taken. We got within a few yards of a bird one day, but it managed to escape our view, and its nest also, for we had to retire before the rising tide. It is no joke being overtaken by the tide in a square mile of reeds eight feet high. Some of these reeds grow to an enormous height, one we measured being twelve feet nine inches in length!

The Marsh Warbler, *Acrocephalus palustris*, was in considerable numbers, but it had not begun to lay, and the only satisfaction we had was in finding several nests, just ready for

eggs, fixed on the reeds like those of *A. streperus*, and beautifully lined with horse-hair. Sometimes they were right in the middle of the beds, and sometimes in more open places.

We came across two pairs of Savi's Warbler, *Locustella luscinioides*, but only found the nest of one of these, and it contained five young, almost fledged, this being on the 12th June. It was beautifully constructed of the broad, flat tops of the reeds, very deep and symmetrical, and we brought it away with us, removing the young into that of a Sedge Warbler procured for the purpose. It was most carefully concealed in a thick bunch of grass, close to the ground, and in a very boggy place, though not one affected by the tide, it being on the landward side of the dyke bounding the Hollandsch Diep. The old birds were never seen near the nest, and then only for a moment, as they flew for a few yards over the reed tops, and then popped down again. Their "trill" is very distinguishable from that of the Grasshopper Warbler, not being (as Mr. Dresser remarks) so continuous, and having more tone. I thought of attempting to rear some of the young, but on going for them found them gone. The parents, no doubt, had removed them, such being the habit of the Warblers, if their nest be disturbed, and the young fit. They were not able to fly.

On the 11th June, we watched for a long time a pair of large birds with hawk-light flight, which were quartering the marshes very assiduously, and whose identity puzzled us a good deal at first, but which turned out to be Marsh Harriers, *Circus æruginosus*. We put up one of them from the nest, which was only about fifty yards distant from that of the Savi's Warbler just described, and in the same marsh, about ten yards from firm ground. The nest was a large heap of reeds and sedges forming a flat mass three feet long, and two feet across, and appeared to have been used many years, one nest being built on the top of another. There were three young, the eldest a week, and the youngest a day or two old. They were covered with brownish yellow down; cere and legs, yellow; bill and claws, black; iris, very dark brown. We brought two of them home, leaving the youngest, and on June 20th, the elder of these attacked the other, injuring it so much that it died next day. On June 22nd the sprouting quills and tail were black, tipped with brown; scapularies, black; wings from tip to tip, 2 feet 8½ inches. June 29th,

wings, 3 feet $4\frac{1}{2}$ inches. July 18th, 4 feet $2\frac{1}{2}$ inches. On the 24th September, the expanse of wings was 4 feet $5\frac{1}{2}$ inches, and the down had disappeared altogether, except a few sprays on the head, the crown of which, with the chin, was of a rich chesnut. The irides light hazel-brown; the rest of the body, wings, and tail, dusky black; most of the feathers tipped with light chesnut-brown, and some on the shoulders and nape margined with this colour. The upper tail-coverts are lighter and the tips more reddish. The pellets ejected by the young birds before they had been fed artificially consisted mostly of mouse and rat-hairs, mixed with small bones, bits of beetle wing-cases, and seeds of plants; the last probably from the intestines of the rats.

We had rather an unpleasant rencontre on one occasion with some fishermen who tenant one of the islands of the Hollandsch Diep, on which we had landed. It was raining in torrents, and after fighting our way for some time through reed-beds soaking wet, and losing ourselves in a willow-swamp, we hailed with joy a well-made footpath, at the end of which we suddenly came upon an elaborate decoy for wild ducks. Never having seen any of our English ones, I am unable to say whether they are constructed on a similar principle, but this one consisted of perhaps an acre of open water fringed with trees and bushes, and with a "pipe" at each of the four corners. These "pipes" were arranged, so to say, in two pairs, each pair leading in a curve along the north and south sides of the pond, until their apices nearly met. I had walked round and examined the "pipes," and was watching a small flock of ducks which were on the water, when I heard a shout from my companion, and going to him, found him being most menacingly accosted by two Dutchmen, whose excited words, though unintelligible to us, evidently expressed some very forcible ideas. We were trespassers, there was no doubt, and looked upon with great suspicion, which was not much allayed by our endeavours to indicate our pursuits by displaying the entomological collecting-boxes. Unable to muster sufficient Dutch to explain our peaceable intentions, we parted from our sulky companions, who professed to point out the way to our boat; but to make a long story short, we followed their directions until we were regularly fast in swamp and tangled willow, and with a rapidly rising tide. They then came to us in a boat, and gave us

to understand that for the small sum of "twee gulden" they would take us to our own boat, otherwise, if we remained where we were, the tide would rise up to our breasts. We paid our money, and they kept their bargain. Of course we did not venture there again.

The following insects were procured at Valkenswaard, in the identification of which my friend Mr. Naylor has kindly helped me:—

COLEOPTERA:—*Cicindela campestris*, *hybrida*, and *Germanica*; *Silpha thoracica*, *nigrita*, and *reticulata*; *Pterostichus dimidiatus*; *Carabus granulatus* and *auratus*; *Lina populi*; a species of *Galerucidæ*, and also one of *Elateridæ*, not determined yet; *Coccinella 14-punctata*.

ORTHOPTERA:—*Acheta campestris*.

HYMENOPTERA:—*Vespa crabro*.

The caterpillar of the Goat Moth, *Cossus ligniperda*, was taken on some willows on the banks of a pond, and that of the Poplar Hawk Moth, *Sphinx populi*, was also obtained. Four dead specimens of the Emperor Moth, *Saturnia pavonia-minor*, were picked up on one of the heaths, and the Buff-tip, *Pygæra bucephala*, was very common. Near Dordt we found some hedge-rows and gardens completely devastated by the Forty-spot Moth, *Hyponomeuta padellus*. Without exaggeration, in several hundred yards of hawthorn hedge, there was not a single leaf; it was completely covered by their webs and caterpillars. Hundreds of apple-trees, too, were in the same state. On the hawthorn there were also mixed with them a considerable number of caterpillars of the Gold-tail, *Porthesia auriflua*, but we did not see them on the apple. We also took the Drinker Moth, *Odonestis potatoria*, on the buckram grass near the Savi's Warbler nest, and of other Lepidoptera:—*Cataclysta limnata*, *Lomospilis marginatus*, *Camptogramma bilineatus*, *Tortrix viridana*, from Willemsdorp: *Glisiocampa neustria*, from Dordt.

Amongst the *Neuroptera* we procured specimens of *Panorpa communis*.

We collected a few *Mollusca*, amongst which were identified *Planorbis corneus* and *carinatus*, *Limneus stagnalis*, *Helix nemoralis* and *hortensis*, and *Paludina vivipara*.

NOTES FROM AN ARCTIC JOURNAL.

BY H. W. FEILDEN, F.G.S., C.M.Z.S.

(Continued from Zool. 1878, p. 451.)

On the 24th of August, a lead opening to the westward, our ships left Bessels Bay, and, crossing Hall Basin, we entered, early on the following morning, a large and well-protected harbour on the coast of Grinnell Land. The aspect of the western side of the Sound differs entirely from the Greenland or eastern shore which we had just left. Instead of the mural cliffs of limestone capped by a *mer-de-glace*, with glaciers descending into the sea, Grinnell Land appeared as a series of peaked mountains rising to an altitude of 2000 to 3000 feet, with deep valleys intervening between them. Though covered with snow at that season, yet we could see that no glaciers occupied the valleys, and that in all probability they would prove accessible. As we neared the inner shore of the bay a herd of Musk-oxen were seen about a quarter of a mile from the shore: a party from our ship landed, and, after a smart chase, killed the entire herd numbering nine—an old bull, four old cows, two young bulls, and two young cows. This provided us with a supply of over 2000 lbs. of fresh meat. Unless shot through the heart, the Musk-ox is very tenacious of life; their shaggy coat is a great protection, and when wounded or brought to bay their habit of facing the enemy, sinking their muzzle, and only exposing the crown of the head with its armature of horn and heavy horn cores, renders the animal almost bullet-proof. The old bull, though shot through the body and with a hind leg broken, still kept facing us and endeavouring to charge. One of us stepped up to within five paces and fired a Snider rifle bullet point-blank between its eyes. This had no appreciable effect, and an examination of the skull afterwards showed merely a dent where the bullet had struck. Not until the animal was taken in flank and a bullet put into the region of the heart did it succumb. This animal was as large as any we afterwards procured. Its head and horns weighed 54 lbs., rest of the hide 50 lbs., and the carcase, when cleaned and brought on board ship, 385 lbs. The measurements of the head were as follows:—From apex of skull to point of nose, 24 inches; breadth between the eyes, 13 inches; horns, measured inside the curve, 26 inches: greatest

breadth of horn, 11 inches. The stomach of these animals is very capacious. This old bull had as much in it as would have filled four ordinary stable buckets. It consisted entirely of the leaves and shoots of *Salix arctica* and grasses. In none of those I examined were any lichens, which is the food usually ascribed to these animals.

During the winter season the Musk-ox is covered with a long stapled fine wool in addition to its coat of hair. This wool is of a light yellow colour, and of a beautiful silky texture, but at the season when we shot the animals very easily detached from the hide; indeed, it would not adhere to the skins of any of the animals we killed, but came away from it during the process of curing. Owing to the great length and softness of this wool* the fleece of the Musk-ox, if obtainable in sufficient quantities, would be of considerable value, and, if it were possible to re-introduce this animal into Great Britain, or to the continent of Europe, it would be a most valuable accession to our fauna. No doubt from the nature of the lands inhabited by the Musk-ox at the present day it would be a matter of considerable difficulty to capture and convey the animals to Europe, but I imagine the difficulties in the way are not insuperable. To equip an Arctic Expedition simply with a view to capture some young Musk-oxen would hardly be a practical suggestion, but these animals still wander in considerable numbers amid the barren lands of the North American Continent and along the shores of its Frozen Ocean. The influence of the Hudson Bay Company extends even to those desolate regions, and the acclimatisation of the Musk-ox is a matter worthy of the consideration of the gentlemen who direct the affairs of that Company in America. In any case a living example of the animal would command a great price from the zoological societies of Europe. From what I have seen of the Musk-ox in a state of nature, it does not appear that there would be any great difficulty in domesticating it. Its habit of flocking when alarmed by a dog, and facing its foe, would render it amenable to guidance, and I am quite sure that the Musk-oxen we met with in Grinnell Land might all have been headed and brought to bay by one of our Scotch sheep-dogs.

* According to Richardson (Fauna Bor. Amer.), stockings made from the wool were more beautiful than silk ones.

The harbour that we had reached appeared so admirably suited for a ship's winter-quarters that Captain Nares decided to leave the 'Discovery' there, and, in consequence, this large inlet was named Discovery Bay. The 'Alert' quitted her consort on the 26th August; but owing to the mouth of the harbour being blockaded by heavy pack-ice it was a couple of days before we lost sight of the masts of the 'Discovery,' and were again fairly in the channel. By that date the short summer of the Polar zone had come to an end, the temperature of the air throughout the day sunk below freezing-point, the few species of birds that make those regions their breeding-haunts were hurrying south, whilst the streams, rivulets, and marshes were frozen over. A few small bands of Knots and Turnstones were seen winging their way southward, following the coast-line, and associated with them were parties of Snow Buntings.

Somewhat to my surprise, on a small islet just at the entrance of Discovery Bay, we found some eight pairs of the Arctic Tern, *Sterna macrura*, breeding, and a newly-hatched young one in a nest surrounded by snow; but Admiral Richards, when sledging in Belcher Channel, in $77^{\circ} 8' N.$, on August 29th, 1852, likewise found a colony of these birds nesting, and three young ones unfledged in their nests.

On the 28th August the rudder of the 'Alert' was so injured by contact with the ice that the ship was run alongside of the shore-ice in the most sheltered position obtainable and the spare rudder fitted. Whilst we were thus employed a small party of five Musk-oxen were seen on shore, and several of us started in pursuit, eventually securing three of the animals. I there met with an accident which might have had serious consequences, but, fortunately, was only productive of a laugh against me. One of the Musk-oxen, a young animal about three years old, being badly wounded, separated from the herd. Following it alone I came up with it in a valley where the deep snow hampered its progress. Another shot fired brought it to a standstill. When I got alongside of it the animal put its head to the ground and came towards me, but stopped when I struck his muzzle with my gun. Reflecting that we were some three miles from the ship, and the intervening ground very rough, and deep in places with snow, it struck me it would be an excellent thing if I could induce the wounded animal to transport its own carcase to the

beach, and, consequently, by backing in the direction of the sea I got the Musk-ox to follow me. At last the animal stopped, and, losing all patience, I laid hold of it by the horns and endeavoured to drag it the way I wanted. This was too great an insult; the animal drew back, gave an angry snort, and, striking me in the stomach, knocked me nearly senseless into the snow, my rifle flying in another direction. Fortunately for me the beast did not follow up its advantage. I rolled away as soon as possible from under its nose, and, getting hold of my rifle again, shot it dead.

After re-fitting the 'Alert' with a new rudder, the passage of Robeson Channel was again attempted; but on the 30th August we were caught in the pack off Lincoln Bay, and our ship was in very great danger of being crushed. The ice which surrounded us when in the pack was of amazing thickness, the floe-pieces floating eight and ten feet above the water, or, in other words, representing fifty to a hundred feet of thickness. As these masses closed against one another their edges crumpled up, and ridges of hummocks reared themselves to a height of twenty feet above the level of the floes, overtopping the bulwarks of the ship. Fortunately we were protected to some extent by a quantity of rubble-ice, which was packed between the heavier floes, and, acting as a buffer, fended off the greater part of the pressure, but the ship groaned and creaked, and the dismal sound of the ice crunching against her sides added to our discomfort, knowing that we were drifting helplessly with the wind and tide. Fortunately, however, we managed to clear out of the ice, and gained the shelter of Lincoln Bay just as a strong southerly gale came tearing up the channel.

Whilst fastened to the land-ice of Lincoln Bay some of our party went on shore and brought back two Hares. One weighed nine pounds, the other only five and a half. Both had the ears tipped with black. The smaller of the two had a malformation of the skull, the nasal bones being twisted to the right and the incisors of the upper jaw deflected in that direction. In the lower jaw only the left incisor was developed, and that protruded in nearly a horizontal direction to the front. A dead Knot was picked up, and two Ivory Gulls were seen flying about the ship. Aldrich, when fixing ice-anchors, observed what he described as a yellowish-coloured worm-like creature wriggling in

the water, which measured about nine inches to a foot in length. This was, doubtless, a free-swimming Annelid.

By the morning of the 1st September the strong gale from the south-west had pushed the pack so much off the shore that a water-way was visible as far as Cape Union. This we ran through under sail, and in the highest state of excitement; but our joy was short-lived, for, after rounding Cape Union, the land, instead of stretching north, trended to the N.N.W. The lane of water came to an end, and in front of us was the illimitable Polar pack. Under the lee of the stranded masses from the Polar floes we took shelter, and this spot afterwards, given the name of Floeberg Beach, became the winter-quarters of the 'Alert' during 1875 and 1876.

It is hardly within my province to detail the various endeavours made to gain a more northern position. This has already been told by Captain Nares in his account of the voyage. I may merely state that it was some days before we could realize that our progress northward in the ship was at an end. We had to wait for clear weather, and many an ascent of the hills in the vicinity, then deep in snow, before we could force ourselves to believe that President Land, reported by the American 'Polaris' Expedition, and laid down in their charts, was a myth. However, we were all, even the most sanguine, forced at length to admit that such was the case.

As soon as Floeberg Beach had been finally designated as the place for wintering, the greatest activity prevailed amongst our small crew; provisions had to be landed, spars lowered, anchors and cables taken on shore, and, besides, preparations had to be made for the serious work of the Expedition, namely, advancing by sledge-parties, the depôts of provisions to be used in the explorations of the following year.

The country in the vicinity of our winter-quarters at that time presented a very dismal appearance; the new fallen snow lay thick and soft, the young ice was forming rapidly over the pools between the grounded pack and the shore. We were also subjected to fog and snowstorms, with a daily falling temperature. Animal life was very scarce; a few Eider Ducks, a family-party of Long-tailed Ducks, a few Turnstones, a single Snow Bunting, a Dovekie, and a Hare were all that we saw in the neighbourhood. On the 5th September Markham and Aldrich, whilst sledging in

the direction of Cape Joseph Henry, came across eleven Eider Ducks in a small patch of water near the entrance of Dumbell Bay. Three were old birds, the others about three-parts grown. They shot five of them with their rifles, but finding that the ice around the pool was too thin to support them they had to leave the dead birds. A Turnstone kept flying around, and when the firing ceased alighted on one of the dead ducks which had been shot through the head, and greedily devoured the brains and exposed flesh. This shows to what straits the birds visiting the Polar zone are sometimes reduced to at times, for I have already noticed the finding of a Turnstone with its stomach filled with the seeds of *Draba alpina*.

During the whole of the month of September and up to the middle of October, when the sun disappeared, sledge-parties were absent from the ship. All engaged in these operations suffered more or less from the dangers and discomforts inseparable from autumn-sledging. Three men on returning to the ship had to submit to amputation of part of their feet on account of frost-bite, and several others were laid up and disabled for a long time. They had the satisfaction, however, of knowing that the work they had been engaged on was admirably performed, and that a large *depôt* of provisions had been placed in advance on the northern coast-line, in readiness for next year's sledging.

The result of our zoological observations during these journeys was very meagre. Aldrich, and Frederic our Greenlander, saw a seal, *Phoca hispida*, in a pool of water not far from Cape Joseph Henry, in lat. $82^{\circ} 47' N.$; another was killed at Dumbell Harbour, lat. $82^{\circ} 30' N.$, by Dr. Moss; a few Hares were seen and secured; the tracks of Foxes, Lemmings, and Ermine were seen, but not the animals themselves; and I found the skeleton of a Musk-ox in lat. $82^{\circ} 33' N.$ Only a few birds were met with; a pair of Long-tailed Ducks were shot on September 16th; a Snow Bunting was seen on the 14th of the same month, in lat. $82^{\circ} 35' N.$ Markham came across four Ptarmigan, *Lagopus rupestris*, in lat $82^{\circ} 40' N.$, on September 29th; and the last bird seen in the autumn of 1875 was a Snowy Owl, on October 2nd. When returning on that date to the ship I noticed a large white bird perched on the top of a hummock. On going to the cabin for a gun I found my companions seated at dinner, so, being unwilling to disturb them, foolishly went in

pursuit of the bird by myself; it was snowing at the time, and the spaces between the hummocks being filled up with drift, hid the cracks and were very treacherous. When I got within about seventy yards of the bird the snow and slush gave way beneath me, and I sunk through the snow above my middle into water over my knees, without feeling bottom, but by good luck I managed to scramble out on to a firm piece of ice. After firing a parting salute at the owl, which made it flap off lazily to the southward, I ran back to the ship at my best pace, but before I reached it that portion of my clothing which had been immersed was frozen as hard as any board. With my present experience I should think twice before chasing a bird over unsolidified pack in the winter, and certainly would not dream of doing so again without a companion and a piece of rope.

The finding a species of Charr, (*Salmo arcturus*, Günther), in a small lake in lat. $82^{\circ} 34' N.$, was of importance, as it convinced us that these pieces of fresh water cannot freeze to the bottom during winter. Dr. Günther states that this salmonoid comes nearest to the Charr of Killin, Inverness-shire, but cannot be considered identical. In the stomach of one I examined, captured in October, I found a perfect and beautiful *Hydrachna*, and the remains of some dipterous insects. It is an interesting and unsolved problem with me, how these fresh-water fish got to the lakes they now occupy. The pieces of fresh water in which we found them are at no great altitude above the present sea-level, and in every instance communicate with the sea, whilst the area in which they are situated is undoubtedly one of rapid upheaval. These lakes are fed by the melting of the surrounding snow, and have no communication with lakes at a higher altitude, which, if ever they existed, are now hidden by the perpetual snow. Still I think it more likely that these Charr are the descendants of an ancient race that retreated to the shore-line as the land rose, and their old habitats became buried in snow, than immigrants from the sea in modern times; for all the species of Charr with which we are acquainted are essentially fresh-water fish. In the Færoe Islands, which apparently have been separated from the continent of Europe since Miocene times, a species of Charr is found; and it would be very desirable to compare Færoese specimens with those from Grinnell Land.

Our allies the Eskimo dogs did us good service during the autumn-sledging. At one time we had thirty of them on board the 'Alert,' but disease and weeding-out the worthless ones reduced the pack to about one-half that number by the commencement of winter. The origin of the peculiar disease to which these animals are subject has not yet been explained. In one form the disease commenced with staggering, accompanied by foaming at the mouth. Between the paroxysms the unfortunate animals wandered about in a half-conscious state, snapping at everything that came in their way, their countenances exhibiting a peculiarly distressed and anxious appearance. In most cases the disease was accompanied by great constipation, which, with some, yielded to a drastic purge of croton oil, whilst the later stage of collapse was alleviated, and in one or two instances overcome, by giving warm soup and stimulants. Another form of attack was very common on the sledge-journeys. When running, the dog would give a yelp and roll over on its back, the legs jerking spasmodically, and foam in many cases pouring from the mouth. The animal generally recovered from these attacks in a few minutes, and would renew its pulling with the team, but for the rest of the day would have a foolish, dazed expression. That in some cases the animals were semi-conscious during these attacks was shown by their anxiety to get away from the neighbourhood of water, of which they stand in considerable dread, experience having taught them that, when sledging, the presence of water and treacherous ice may be coupled together. That the disease is not true rabies is certain, for there is no evidence that it is transmissible by a bite; neither has a case of hydrophobia ever been recorded from the settlements in Greenland, where the disease has been rife. The recovery also of many of the animals attacked is still further proof, if necessary. It is very evident that darkness is not the producing cause of the disease, for our pack suffered as much, if not more, in the period of perpetual daylight as during the winter. The disease attacked dogs of the pure Eskimo breed and those showing a cross with rigid impartiality, and we could detect no difference in the symptoms occurring in either strain. Still more singular is the fact that during the summer of the following year, a beautiful black retriever bitch, brought from England by Captain Markham, which lived in the wardroom and enjoyed excellent health during

the winter, was attacked when out walking with me in a precisely similar manner to the Eskimo dogs. From that date until her arrival in England she sickened and pined away, but immediately after landing recovered, and is now as healthy an animal as one would wish to see. A cat now in my possession, and in perfect health, used to be seized with fits, of precisely the same description as those which attacked the dogs, when taken on the upper deck, to which she had the greatest aversion, even in summer. The Eskimo dogs, though voracious and filthy feeders,* could not be induced to eat bread-biscuit or even meat-biscuits which had been brought from England especially on their account. On October 13th, Egerton, who had been driving a dog-team, told me that two of his dogs had been taken with fits, on his return journey, and that a third, when close to the ship, gave a yelp and rolled over dead. This animal he had brought alongside for me on the sledge. When I got hold of the dog it had not been dead more than ten minutes, and, though exposed to a temperature of minus 10° F., was quite limp, so I conveyed it below and placed it in a cabin with a temperature varying from +33° to +38 F°. There it remained seventeen hours, and at the expiration of that time I went to dissect it. Much to my surprise I found its abdominal regions in a state of putrefaction, and the smell in the cabin so overpowering that it had to be washed out with carbolic acid and hot water to render it habitable. I opened the heads of several of these animals, and, in accordance with a suggestion of Professor Huxley, searched but without success for *Pentastomum*, a large-sized vermiform parasite which occurs in the frontal sinuses of the dog. The period of gestation with the female of the Eskimo dog is precisely the same as that of other domesticated dogs.

* Stercore humano precipuè gaudent. Per longam hiemem apud Floeberg Beach hoc pabulo, præ ceteris omnibus, vesci solebant ita ut *canes stercorarios* accuratius eos vocares. Quin etiam, quum itinera facerent, ipse auriga ne ventrem quidem laxare ausus est, nisi fusti aut flagello armatus, quo avidos canum greges arceret.

(To be continued.)

THE LAND AND FRESHWATER MOLLUSCA OF MAYO AND SLIGO.

BY AMY WARREN.

So FAR as I am aware, no catalogue of the Mollusca of these counties has been published, and, as local lists from remote districts are always interesting to naturalists, I have ventured to send you the following catalogue of the shells I have collected in this part of Ireland. The area that I have hitherto worked has been very limited, extending only a few miles into either county from Ballina. I am the more induced to forward it, short as it is, in the hope that other conchologists who may have collected beyond this area may help to complete the catalogue by sending to 'The Zoologist' the result of their researches.

The nomenclature and arrangement which I have adopted is that of Mr. Gwyn Jeffreys, who has very kindly named some of the specimens for me. I must also express my acknowledgments to Mr. A. G. More for having obligingly assisted me in determining some of the rarer forms.

I. TERRESTRIAL MOLLUSCA.

UNIVALVES (GASTEROPODA).

Fam. LIMACIDÆ.

Arion ater. The Black Slug.—Common everywhere.

A. hortensis. The Garden Slug.—Very common in gardens.

Limax gagates. The Brown Slug.—Common in the garden here at Moyview. During the rainy weather of the past autumn I got several on the cabbages. Mr. Norman has given a very good description of this slug in 'The Zoologist' for 1853, and has remarked that when at rest it assumes a more rounded form than any other member of the genus, contracting and squeezing itself into so small a compass that its height is but little exceeded by its length. Its slime is thick and glutinous, resembling varnish.

L. marginatus. Sowerby's Slug.—I have found three examples of this slug in the woods at Moyview.

L. agrestis. The Field Slug.—Is only too abundant. It caused great destruction in the oat-fields this year, cutting down the young plants in vast quantities.

L. arborum. The Tree Slug.—Common in the woods. It prefers old trees, feeding on the decayed wood and not touching the leaves.

L. maximus. The Great Slug.—This is not so common as the two last-named species.

Fam. HELICIDÆ.

Succinea elegans. The Slender Amber Snail. — Abundant beside every stream. I have not yet found any other species of *Succinea* here.

Vitrina pellucida. The Transparent Glass Shell.—Everywhere distributed under wet leaves in hedgerows and in woods.

Zonites cellarius. The Cellar Snail.—Common, in cellars and drains, and under loose bricks and large stones.

Z. nitidulus. The Shining Snail.—Moyview woods, Sligo.

Z. purus. The Clear-shelled Snail.—Sparingly under moss.

Z. nitidus. The Glossy Snail.—I met with a few specimens in a marsh on the glebe lands of Killanley, Sligo.

Z. crystallinus. The Crystalline Snail. Common.

Z. fulvus. The Tawny Snail. In marshy land at Moyview and Killanley.

Helix aculeata. The Prickly Snail. Rare in this district. I have only found it in one spot, namely, in one of the Moyview woods amongst mossy stones.

H. aspersa. The Common Garden Snail.—Abundant. I have found a pale yellow and white variety on the ruined walls of Moyne Abbey, near Killala, Mayo.

H. nemoralis. The Wood Snail.—Generally distributed, and exceedingly numerous on the sand-hills of Bartragh Island, Killala Bay, where the var. *hortensis* is also common, and their colours are more bright and varied than I have seen in any other locality.

H. rufescens. The Rufescent Snail.—Most abundant.

H. hispida. The Bristly Snail.—Common.

H. sericea. The Silky Snail.—I have obtained this species in one locality only. It is abundant in a small field of moist meadow land on Killanley Glebe. I think it must be rare in Ireland, for Mr. Gwyn Jeffreys has not mentioned an Irish locality for it in his valuable work on British Conchology.

H. caperata. The Wrinkled Snail.—Rather common.

H. ericetorum. The Heath Snail.—So numerous that on a moist day in summer it is difficult to avoid crushing them at every step as they crowd on the grassy pathways.

H. rotundata. The Rounded Snail.—Common everywhere.

H. rupestris. The Little Wall Snail.—Numerous on old walls.

H. pygmæa. The Pygmy Snail.—Generally distributed, although not numerous.

H. pulchella. The White Snail.—Common.

Bulimus acutus. The Banded Twist Shell.—Abundant on the sand-hills of Bartragh Island, and also on those of Enniscrone on the Sligo side of the bay.

Pupa ringens, Jeffreys.—Sparingly at Moyview and Killanley; abundant in the old woods of Belleek Manor, the seat of Sir Charles Knox Gore, near Ballina.

P. umbilicata. The Umbilicated Chrysalis Shell.—Common.

P. marginata. The Margined Chrysalis Shell.—Hitherto I have only found the dead shells of this species once on the sandy shore of Bartragh, and on another occasion at Enniscrone, where I procured several, in company with *Vertigo angustior*, washed up on the sands by the little river flowing past the village.

Vertigo antivertigo. The Marsh Whorl Shell.—Generally distributed.

V. pygmæa. The Dwarf Whorl Shell.—Common.

V. substriata. The Slightly-striate Whorl Shell.—A few specimens at Killanley only.

V. angustior. The Narrower Whorl Shell.—I have found this rare shell in the marshy meadow at Killanley Glebe, and a few weathered shells on the margin of the river at Enniscrone. Mr. Gwyn Jeffreys only mentions two Irish localities for it, one in the Co. Clare and the other at Connemara in the Co. Galway.

V. edentula. The Toothless Whorl Shell.—Under wet leaves in one of the woods at Moyview it is rather abundant. I have also found a few at Killanley.

Balia perversa, vel *fragilis*. The Fragile Moss Shell.—Generally distributed.

Clausilia rugosa, vel *nigricans*. The Dark Close Shell.—Abundant everywhere.

Cochlicopa lubrica. The Common Varnished Shell.—Plentiful.

Carychium minimum. The Little Sedge Shell.—Numerous everywhere under moss.

II. AQUATIC MOLLUSCA.

BIVALVES (CONCHIFERA).

Order LAMELLIBRANCHIATA.

Fam. SPHÆRIIDÆ.

Sphærium corneum. The Horn-coloured Sphærium.—Common in several small lakes in the district; and in Lough Conn, Mayo, I have found also the var. *flavescens*.

Pisidium fontinale. The Stream Pea Shell.—Common.

P. pusillum. The Little Pea Shell.—Still more common and numerous than the last-named.

P. nitidum. The Glossy Pea Shell.—Cloonagh Lough is the only locality where I have obtained this bright little shell.

P. roseum. The Rosy Pea Shell.—Rather rare.

Fam. UNIONIDÆ.

Unio margaritifer. The Pearl Mussel.—Mr. Little, of the Moy Salmon Fishery, has given me several very fine specimens of this shell, taken by the fishermen from the Moy above the weirs at Ballina. I have also got some from Mr. Symes, of the Geological Survey, procured by him, I believe, in the river at Newport, Mayo.

Anodon cygnea. The Swan Mussel.—Numerous in Cloonagh Lough, and Mr. Little has given me two young shells from the Moy.

Order PECTINIBRANCHIATA.

Fam. NERITIDÆ.

Neritina fluviatilis. The River Neritina.—This peculiar and pretty little shell I have found in Cloonagh Lough, a little moorland lake about a mile and a half from Ballina, on the Mayo side, and in Lough Talt, situated in the Ox Mountains, Sligo. Dead shells have also been taken from the mill-race of Bunru Mills, near Ballina.

Fam. PALUDINIDÆ.

Bythinia tentaculata. The Tentacled Bythinia. — Common everywhere.

Fam. VALVATIDÆ.

Valvata piscinalis. The Common Valve Shell.—Generally distributed.

V. cristata. The Crested Valve Shell.—I have obtained this species in two places only, viz., in a pond at Dooneen, Sligo, where it is plentiful; and in a slow stream near Enniscrone, Sligo, where I have found a few specimens.

Order PULMONOBRANCHIATA.

Fam. LIMNÆIDÆ.

Planorbis nautilus. The Nautilus Coil Shell.—Somewhat rare. I have taken a few shells in Raroneen Lake, Mayo, and the var. *cristata* in a slow stream in Castletown demesne, Sligo.

P. albus. The White Coil Shell.—Cloonagh Lough only.

P. glaber. The Smooth Coil Shell.—Very rare. I have only procured it on one occasion, when I found two or three in a slow stream near Enniscrone, Sligo.

P. spirorbis. The Round-spired Coil Shell.—Very common in old bog-drains.

P. contortus. The Twisted Coil Shell.—Common and generally distributed.

Physa hypnorum. The Slender Bubble Shell.—Extremely abundant in an old bog-drain near Castletown, Sligo. The specimens met with, however, are all of small size. The largest I have seen here were given me by Capt. W. K. Dover, taken by him from a deserted quarry-hole at Knockroe, Sligo.

P. fontinalis. The Stream Bubble Shell.—Generally distributed.

Limnæa peregra. The Wandering Mud Shell.—Common everywhere.

L. stagnalis. The Pond Mud Shell.—Generally distributed.

L. palustris. The Marsh Mud Shell.—Common.

L. truncatula. The Truncate Mud Shell.—General, though not plentiful.

Ancylus fluviatilis. The River Limpet.—In several localities on and under stones in shallow water as well as on submerged leaves.

OCCASIONAL NOTES.

WEASEL ASSUMING A WHITE WINTER COAT.—On November 25th, 1878, a female Weasel was killed at Northrepps, Norfolk, which was evidently assuming a white winter coat, a circumstance which is very rare in the Weasel, though not uncommon in the Stoat. In this specimen the front and sides of the head are already quite white, and white hairs are appearing amongst the brown ones, in all those parts of the animal which are normally brown, and especially on the flanks and tail.—J. H. GURNEY (Northrepps Hall, Norwich).

OCCURRENCE OF THE BLACK-THROATED WHEATEAR IN LANCASHIRE.—At a meeting of the Zoological Society held on the 9th November last, Mr. Sclater exhibited a specimen of the Black-throated Wheatear, *Saxicola stapazina*, which had been shot at Bury, in Lancashire, on or about the 8th May, 1875, and read an extract concerning it from a notice communicated by Mr. R. Davenport, of Bury, to 'Science Gossip' of October 1st, 1878. From this communication, and from subsequent correspondence with Mr. Davenport (Proc. Zool. Soc., 3rd Dec., 1878), it appears that the bird in question was shot by Mr. David Page, of Bury, on the margin of the Bury and Radcliffe Reservoir, and was taken in the flesh to Mr. Wright Johnson, of Prestwick, to be mounted. Mr. Johnson ascertained the sex by dissection to be a male. This is believed to be the first time this bird has been met with in the British Islands. It is figured by Mr. Dresser ('Birds of Europe,' part xxv.), under the name *Saxicola rufa*.—J. E. HARTING.

SABINE'S SNIPE IN LANCASHIRE.—I have just set up an adult female Sabine's Snipe, which was killed near Rufford, twelve miles from Liverpool, during the second week of December, and was brought to me along with a Spotted Crake. I have preserved the ovary for my own collection, and, without breaking the egg-bag, counted 268 eggs; whence it appears to me that it is one of the most abundantly supplied wild birds I know. The form of the ovary in Sabine's Snipe is peculiar; it is broadest at the top, narrowing down to two eggs in width, like a long narrow bunch of grapes, three-sixteenths of an inch wide at the top, and fully three-eighths of an inch long. I have taken care also of the sternum. The severe weather of the second week of December brought myriads of birds to our flat coast. My warren man supplied to our market six hundred dozens of Sky Larks, all of which passed under my eye, yet there was not the variation of a feather amongst them. Fieldfares and Redwings are abundant, while Song Thrushes are in hundreds—aye, thousands.—C. S. GREGSON (Rose Bank, Fletcher Grove, Liverpool).

DISAPPEARANCE OF SKY LARKS.—Mr. Robert Service, of Maxwelltown, N. B., attributes the diminution in the number of Sky Larks in that district to Starlings destroying their eggs. Without wishing or being able to disprove the fact, I think (speaking from experience in the Midland Counties of England) that the excessive rains and floods of the last few years, at the nesting time of these birds, have more to do with their decrease than the Starlings. In the Dove and Trent meadows especially, numbers of nests of Sky Larks, Meadow Pipits, Yellow Wagtails, Reed Buntings, and Landrails have been destroyed during the last few years, the result being that in such districts these birds are not nearly so numerous as they formerly were.—H. G. TOMLINSON (Burton-on-Trent).

STARLINGS DESTROYING LARKS' EGGS.—With your permission I should like to pass a few remarks on the notes which have appeared in the 'Zoologist,' respecting Starlings and Larks (Zool. 1878, pp. 427, 451). It is certainly new to me this asserted egg-destroying propensity on the part of the Starling, and from my own experience with these birds, no small one by the way, I am loth to believe it. Here, near Sheffield, Starlings breed in numbers, and throughout the year frequent the pastures in search of food; the Sky Lark, too, abounds, yet, so far as I can learn, both species live in peace together. The Starling, as is well known, is a gregarious bird, and seeks its food, as a rule, in flocks. Now these flocks, if closely observed, will seldom if ever be found on the breeding-grounds of the Sky Lark (which by the way is usually amongst the mowing grass, or in the corn-fields), but seek their sustenance on the pasture lands, so that a Lark's nest would rarely be met with. Sky Larks, though gregarious in the autumn and winter months, at the approach of spring separate into pairs and spread over the entire district, seldom more than one or two pairs inhabiting the same field, so that the chance of their nests being plundered by the Starlings would be reduced to a minimum. Again, admitting that Starlings are partial to their eggs, which I deny, are not the parent birds well able to protect their charge? The disappearance of the Sky Larks may probably be explained by a migratory movement in search of food, and when spring time once more arrives they will doubtless reappear in their usual numbers. Again, are not the eggs of all other ground birds exposed to the same danger,—the Pipits, the Wagtails, and the Chats,—and may not the Weasel, the Fomart, or even Field Mice be answerable for these robberies, if it can well be proved that such robberies take place? Do not, I pray, cast blame upon the poor Starling, for not a more harmless bird exists.—CHARLES DIXON (Heeley, near Sheffield).

LITTLE AUK NEAR NORWICH.—A Little Auk was picked up yesterday (December 17th), in this parish, and brought to me alive.—J. H. GURNEY, JUN. (Northrepps, Norwich).

LITTLE OWL IN SOMERSETSHIRE.—A Little Owl was killed here in March, 1878, by a young man whose attention was directed to it by a number of small birds fluttering round the tree in which it was perched. The skin is now in my possession. It is a bad specimen, as the bird was, unfortunately, allowed to remain unskinned for a week after death.—G. W. BRAIKENRIDGE (Clevedon, Somerset).

HONEY BUZZARD IN THE ISLE OF WIGHT.—Mr. F. Smith, taxidermist, of Newport, informs me that a handsome bird of this species, in perfect plumage, was shot on the 7th October by Mr. H. Jacobs, of Sandown, while in the act of robbing a wasps' nest. It had torn out the comb, and was preying on the larvæ, some of which were found in the gullet on dissection. This is, so far as I know, the first instance of its capture in the island, nor have I heard of its being even seen, though the Rev. C. Bury, who some years since published a list of the birds of the island, says that a Buzzard seen by some one (no ornithologist) "was probably the Honey Buzzard."—HENRY HADFIELD (High Cliff, Ventnor).

[Mr. A. G. More, in his "List of Birds" appended to Venables' 'Guide to the Isle of Wight,' observes (p. 428), "the Honey and Rough-legged Buzzards have each been once killed in the island."—ED.]

COLE TIT NESTING ON THE GROUND.—Mr. Butterfield refers (Zool. 1878, p. 351) to a Cole Tit's nest in a hole in a bank as being in an "abnormal situation." I am inclined to think it is not an uncommon occurrence for this species to build in the ground, for I once found no less than three nests in an exactly similar situation in Scotland, *viz.* in a steep slope covered with pine trees; a wall of loose stones on the top of the slope containing a fourth nest. Several authors, among others Selby, Yarrell, Bechstein, Sharpe and Dresser, mention holes in the ground as being occasionally selected by the Cole Tit for nesting purposes. In the spring of the past year I found a nest of the Marsh Tit in the ground at the root of a tree in the New Forest. In this case trees full of holes abounded on every side.—J. YOUNG (5, Denbigh Road, W.).

BIRDS IN HYDE PARK.—On March 26th last I noticed a Pied Wagtail, *Motacilla Yarrellii*, very busy after insects on the banks at the eastern end of the Serpentine. On April 5th, a female Wheatear was on the parade-ground opposite the Barracks; it appeared fatigued, having perhaps only just arrived. On June 16th I put up a Sky Lark near the Deputy Ranger's Lodge. On July 4th I saw the Cuckoo three times in the trees opposite Grosvenor Gate.—EDWARD HAMILTON (Portugal Street, Grosvenor Square).

KINGFISHER FEEDING ON NEWTS.—At a small pond near here, a few weeks since, a gentleman killed one of these birds with a newt in its mouth. There are no fish in the pond or within three-quarters of a mile of it. Two other birds, he tells me, frequent the same pond, or large puddle, for whose lives I have interceded.—H. G. TOMLINSON (Burton-on-Trent).

DEATH OF MR. GEORGE DAWSON ROWLEY.—An estimable gentleman and an accomplished scholar and naturalist has passed away, in the person of the late Mr. George Dawson Rowley, whose death took place at Brighton on the 21st November. For some months past he had been in failing health, consequent upon a serious attack of pulmonary hæmorrhage, and his condition, while necessitating the greatest care of himself, had long been a source of much anxiety to his friends. Unable to take that active outdoor exercise, an indulgence in which is induced by an ardent taste for natural history, he had perforce to content himself at home with those resources which a well-stored mind has ever at command; and with a study of the many valuable objects of zoological and antiquarian interest which were to be found in his museum. From time to time the result of his researches found their way into print in the pages of 'The Zoologist,' the 'Field,' the 'Ibis,' and the 'Proceedings of the Zoological Society,' as well as in occasional pamphlets. His most important undertaking, however, was his 'Ornithological Miscellany,' a quarto periodical, printed at his own expense, and beautifully illustrated with coloured plates. In this work, which will form a lasting monument to his memory, many species of exceeding rarity and beauty are figured and described, either by himself or others of the many able naturalists who contributed to his pages. In addition, Mr. Rowley, at the time of his death, had made considerable progress with an important work upon the Garefowl or Great Auk, *Alca impennis*, of which bird, now believed to be extinct, he was the fortunate possessor of two skins and half a dozen eggs. Amongst the other manuscripts which he has left are "Bits and Fragments round a Saxon Saint," "Chronicles of the Rowleys," and notes for "A History of Huntingdonshire" (in which county, as well as in Rutlandshire, he possessed family property), besides several other unpublished essays of an historical and antiquarian character. Mr. Rowley was the eldest son of the late Mr. George William Rowley, of Priory Hill, Huntingdonshire, and was born on May 3rd, 1822. He married in 1849, Caroline Frances, only daughter of Archdeacon Lindsay, by whom he leaves an only son, George Fyde Rowley. He was educated at Eton and Trinity College, Cambridge, where he graduated M.A., and was a Fellow of the Linnean and Zoological Societies. He was deputy-lieutenant for Rutland, high sheriff for that county in 1870, and a justice of the peace for Huntingdonshire, Lincolnshire, and Rutland. His death will be regretted by a large circle of friends, as well as by his many brother naturalists, to whom he was ever ready to impart the results of his study and experience, and who are indebted to him, through his published writings, for much valuable information.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 21, 1878.—Dr. GWYN JEFFREYS, F.R.S., Vice-President, in the chair.

Messrs. Thomas Davidson, F.R.S. (Brighton), and Frederick James Faraday (Manchester), were elected Fellows of the Society.

Only one zoological paper was read, namely, "A Preliminary Report on the Mollusca dredged by the Staff of H.M.S. 'Challenger,'" by the Rev. R. Boog Watson, B.A. The mass of material received by the author was acknowledged to have been enormous. The mere arrangement of the labelled shells into groups was no ordinary task, remembering that every probable species and its locality had to be kept separate, and allied forms placed in contiguity for reference and subsequent comparison. Then followed the sifting of the dried dredgings, picking out and assorting the minute, almost microscopic shells, succeeded by the examination of those preserved in spirits; simultaneously authorities and types in museums and private collections had to be consulted—all which matters required a considerable expenditure of time and trouble. In this way over 2000 separate lots, including from 1200 to 1500 distinct species, have been already gone over and differentiated. This is irrespective of the Brachiopods, which Mr. Davidson has undertaken, and the Cephalopods, Pteropods and Nudibranchs, which will be worked out by other specialists. The author then proceeded to give a detailed account of the *Solenocoelia*, comprising three genera of Mollusca, viz. (1) *Dentalium*, (2) *Siphodentalium*, and (3) *Cadulus*. The general plan adopted by him is to give, after the name and synonym or other reference, the station, date, geographical position, depth taken from, and nature of bottom; then a description of the animal when available, description of the shell, differences in processes of growth, and general remarks and comparisons. The species of *Dentalium* are eighteen in all; of these eleven are new forms, as follows:—*D. ageum*, *D. amphialum*, *D. ceras*, *D. diarrhoea*, *D. leptocetes*, *D. circumcinctum*, *D. acutissimum*, *D. compressum*, *D. didymum*, *D. yokohamense*, and *D. tornatum*; the remainder already known consist of *D. capillosum*, *D. entalis*, *D. longirostrum*, *D. subterfussum*, *D. dentalis*, *D. javanum*, and *D. ensiculus*. The *D. capillosum*, Jeffreys (*vide* 'Valorous' Exped. Report Roy. Soc.), was obtained by the 'Challenger' staff off the Azores, in globigerina ooze, at 1000 fathoms depth. A new variety of this species (var. *paucicostatum*, Watson), also obtained, has about forty instead of sixty-five longitudinal riblets. Of the *D. entalis*, Linn., three varieties were met with—viz. the var. *striolatum*, Stimps., *agile*, Sars, and var. *orthrum*, Watson. The first of these was dredged off Halifax, the second

at Gomera, Canaries, and the third at Estubal, Fayal, the Azores, and Prince Edward Island. Their geographical distribution is doubly interesting when taken in connexion with antiquity of the species, Dr. Gwyn Jeffreys (following Herr Hörnes) carrying it back to the Miocene age. It appears from a study of *D. acutissimum* that, with reference to the form of the apex of the shell, separation of the *Dentalia* by the absence (in *Dentalium*) or presence (in *Entalis*) of the cleft process cannot be maintained. *D. subterfussum*, Jeff., was got in globigerina ooze at the Azores, in volcanic sand at the Canaries, and in mud at Pernambuco. The animal is unknown. Dr. Gwyn Jeffreys dredged it, in 1869, off the west coast of Ireland. *D. dentalis*, Linn., now living in the Mediterranean, South-West of France, and the Canaries, the 'Challenger' Expedition met with at Fayal, Azores, and Simon's Bay, Cape of Good Hope. The species of *Siphodentalium*, seven in number, are all new to Science; these are, *S. platomodes*, *S. tythum*, *S. pusillum*, *S. tetraschistum*, *S. dichelum*, *S. prionotum*, and *S. eboracense*. Among the species of the genus *Cadulus* nine are new and one a variety: the list runs, *C. colubridens*, *C. vulpidens*, *C. rastridens*, *C. sauridens*, *C. gracilis*, Jeff., *C. simillimus*, *C. curtis*, and the var. *congruens*, *C. obesus*, *C. tumidosus*, Jeff., *C. exiguus*, and *C. ampullaceus*. Of the entire series of the three genera of *Solenocoelia*, as above mentioned, thirty-six species and four varieties are herewith recorded, whereof twenty may be regarded as hitherto unknown.

Three botanical papers were read:—"On Branch-tubers and Tendrils of *Vitis gongylodes*," by Mr. R. Irwin Lynch; "On the *Symplocaceæ*," by Mr. John Miers; and "On *Alga* of Lake Nyassa," by Prof. G. Dickie.

December 5, 1878.—Prof. ALLMAN, F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society:—G. F. Dowdeswell, Wimbledon; Arthur Hammond, Sheerness; Thomas Hanbury, Addiscombe, Croydon; Joseph Sidebotham, F.R.A.S., Bowdon, Cheshire; William Thomson, South Yarra, Melbourne; and Charles A. Wright, C.M.Z.S., Kew.

The first zoological paper read was "On some Coleoptera (collected by Charles Darwin) of Geographical Interest," by Frederick H. Waterhouse. The insects in question have lain undetermined for a great many years, and all prove new to science. *Phytosus Darwinii*, from the Falklands, has unusually long slender claws; *Choleva Falklandica* is elliptical shaped and strongly punctated; *Elmis brunnea* and *Anthicus Wollastonii*, from St. Helena, are noteworthy, for even the late Mr. Wollaston ('Coleopt. St. Helena') does not record either genus as existent there: *Scaphisoma elongatum*, from Rio Janeiro, is the first species of the genus known to inhabit South America; and the *Prosthetops* (*P. capensis*) is a novel genus, with two ocelli, from South Africa.

Dr. Francis Day gave a summary of his third and concluding paper, "On the Geographical Distribution of Indian Freshwater Fishes," in this contribution dealing with the families *Scombresocidæ*, *Cyprinodontidæ*, *Cyprinidæ*, *Notopteridæ* and *Symbranchidæ*. Among the eighty-seven genera two only are African, thirty-two extend to the Malay Archipelago, and twelve are common to Africa and Malaya. Of three hundred and sixty-nine species two are African, twenty-seven Malayan, and two common to both regions. In short, the Indian freshwater fish affinities preponderate to those of the Indo-Chinese and Malayan subregions; thus supporting Mr. Alfred Wallace's opinions, and in opposition to the views held by Mr. Blanford, who gives greater weight to African relationships, at least so far as mammals are concerned. Dr. Day, moreover, believes that the Indian freshwater fishes owe their derivation to three subordinate separate faunas:—(1) That belonging to the Ghauts, Ceylon, the Himalayas, and the Malay Archipelago, wherein may be distinguished two fish races, a Palæarctic and a Malayan. (2) A fish fauna of the plains west of the Indus, with an African element in it. (3) That spread over the plains east of the Indus, and by far the largest, which appears to have a Burmese connection.

The abstract was read of a second contribution, "On the Mollusca of the 'Challenger' Expedition," by the Rev. R. Boog Watson. Of the four genera of *Trochidæ*, that of *Sequinzia* has two new species, and other information is given; *Basillissa* is a new genus, whose labial and basal sinus connect it with *Sequinzia*, while both genera present *Pleurotomaria* features; *Gaza*, also a new genus, is utterly distinct from anything known in the family, in which a reverted thickened lip is an entire anomaly; and the third new genus, *Bembix*, presents the novel feature of an epidermis.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

November 19, 1878.—A. GROTE, Esq., Vice-President, in the chair.

Mr. Selater exhibited and made remarks on an adult specimen, in full plumage, of the Black-throated Stonechat, *Saxicola stapanina*, which had been obtained in Lancashire, and had been sent for exhibition by Mr. R. Davenport. The species had not been previously recorded as occurring in the British Isles, and was an interesting addition to the list of "Accidental Visitors."

The Secretary read two letters he had received from Dr. A. B. Meyer and Mr. A. D. Bartlett in reference to the communication read at the last meeting from Mr. Everett respecting the supposed existence of the Anoa (*Anoa depressicornis*) in the Philippines.

Professor Owen read a memoir on the relative positions to their constrictors of the chambered shells of Cephalopods.

Sir Victor Brooke, Bart., read a paper on the classification of the *Cervidæ*, and gave a synoptical list of the existing species of this family. A second paper by Sir V. Brooke contained the description of a new species of Gazelle from Eastern Africa, which the author proposed to name *Gazella Walleri*, after its discoverer, Mr. Gerald Waller.

Professor A. H. Garrod read a paper on the anatomy of *Indicator major*, and showed that, as regards its soft parts, as in its Osteology, *Indicator* is not related to the Cuckoos, but to the Barbets and Toucans.

A communication was read from the Marquis of Tweeddale, containing the eleventh of his contributions to the Ornithology of the Philippines. The present paper gave an account of the collection made by Mr. A. H. Everett at Zamboanga, in the Island of Mindanao. Ninety-eight species were obtained in this locality by Mr. Everett, of which eleven were new to the Philippine Fauna, and six were new to Science.

Mr. E. R. Alston read some notes supplementary to his paper on the Squirrels of the Neotropical Region.

December 3, 1878.—ROBERT HUDSON, Esq., F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of November, 1878, and called special attention to two examples of Horsfield's Tortoise, *Testudo Horsfieldi*, from Turkestan, presented by Dr. A. Strauch, C.M.Z.S., of the Imperial Museum of St. Petersburg, and a small Blue Maccaw, apparently referable to Spix's Maccaw, *Ara Spixi*, and new to the Society's Collection.

Mr. H. Seebohm exhibited a series of specimens of the Hooded and Carrion Crows, and made remarks on their intermediate forms and geographical distribution.

Colonel L. H. Loyd Irby exhibited and made remarks on the nests, eggs, and young of *Cypselus pallidus*, taken at Gibraltar.

Mr. Howard Saunders exhibited and made remarks on some eggs of Indian Laridæ, *Sterna bergii* and *Larus hemprichii*, which had been taken by Captain Butler, of H.M.'s 83rd Regiment, on the Mekran coast.

Dr. F. Day exhibited and made some remarks on some jaws of Indian Sharks belonging to the genera *Galeocерdo* and *Carcarias*.

The Secretary called attention to an error which had been made in reference to the collection of butterflies from Billiton, reported on by Messrs. Godman, Salvin, and Druce, in the last part of the Society's 'Proceedings.' The collection had been made and forwarded to England by Hr. J. G. F. Riedel, of Koepang.

Mr. Selater communicated some further particulars respecting the occurrence in Lancashire of the specimen of the Black-throated Wheatear, *Saxicola stapazina*, exhibited at the last meeting of the Society.

Professor A. H. Garrod read a paper on the conformation of the thoracic extremity of the trachea, in the birds of the order Gallinæ.

A communication was read from Dr. A. Günther, F.R.S., containing the description of some reptiles from Midian, collected by Major Burton. Amongst these were two new Snakes proposed to be called *Echis decorata* and *Zamenis elegantissima*.

Mr. H. Seebohm pointed out the character of a new *Sylvia* from Abyssinia, proposed to be called *Sylvia Blanfordi*, after Mr. Blanford, by whom it was obtained during the Abyssinian Expedition. Mr. Seebohm also read notes on the identity of the birds which had been named *Horornis fortipes*, *Neornis assimilis*, *Horeites robustipes*, *H. brunneus*, and *H. pallidus*, and proposed to reduce them to one species under the name *Cettia fortipes*.

Mr. Martin Jacoby read descriptions of some new species of Phytophagous Coleoptera, from Central and South America.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

November 6, 1878.—H. W. BATES, Esq., F.L.S., F.Z.S., President, in the chair.

Mr. F. Smith called attention to a passage in Mr. M'Lachlan's "Report on the Linnean Collection," read at the last meeting (*vide* Ent. Mo. Mag. for November, p. 140), wherein the author states, as the result of his examination of the collection, that "there were no traces of mites, *Psoci*, or *Anthreni*." Mr. Smith was of opinion that this statement might lead to the belief that he had affirmed that the collection was actually attacked by mites, *Psoci*, and *Anthreni*, and as this was not the case he mentioned the subject in order to remove any erroneous impression.

Mr. C. O. Waterhouse exhibited a specimen of *Chauliognathus excellens*, a new beetle from the United States of Columbia.

Mr. H. T. Stainton exhibited a new horn-feeding *Tinea* reared from horns from Singapore, *T. orientalis*, allied to the well-known large species from South Africa, of which the larvæ fed in the horns of living buffaloes and antelopes, and which had been described by Zeller under the name of *Vastella*, and subsequently by himself under the name *Gigantella*, both names referring to the extraordinary size of the insect in the genus *Tinea*. The specimens now exhibited were reared by Mr. Simmons, of Poplar, who found them in his greenhouse, and was quite at a loss to account for their appearance till Mr. Stainton suggested they were horn-feeders, when he remembered a piece of horn placed on a shelf and forgotten, but which when examined showed evident traces of having been eaten, and from which pupa-skins had been obtained.

The Rev. H. S. Gorham exhibited the following rare beetles, taken in the neighbourhood of Horsham, Sussex:—*Platypus cylindrus*, Fab., *Lathrobium pallidum*, Nordmann, *Achenium humile*, Nicolai, and *Cryphalus abietis*, Ratzeburg. [Coloured figures of the three first named will be found in Janson's 'British Beetles,' figs. 99, 112, 113.]

Mr. H. Goss exhibited male and female specimens of a rare dragon-fly, *Cordulia Curtisi*, taken at Popesdown, Christchurch, Hampshire. Mr. M'Lachlan made some remarks on the geographical distribution of this species. (See also Ent. Mo. Mag. for Sept. 1878, p. 92.)

Mr. Meldola exhibited a male specimen of a moth from Jamaica, belonging to the genus *Erebus*, and which was remarkable on account of its possessing large scent-fans or tufts on the hind legs. Although the function of these tufts had only recently been made known through the researches of Fritz Müller, this species had been named *E. odoratus* (*Phalæna-Bombyx odora*) by Linnæus. (See also Sloan's 'Jamaica,' vol. ii., p. 216).

Mr. J. Wood-Mason exhibited specimens in alcohol of *Gongylus trachelophyllus*, Burm. (male and female), and of *G. gongylodes*, Linn. Saussure was of opinion that the former species was a variety of the latter, but Mr. Wood-Mason, after examining numerous specimens of both, had found good characteristic differences, and concluded that they were specifically distinct—a view which was corroborated by the difference in the colour of the under side of the prothoracic expansion, a distinction which he had long suspected, but of which he had only recently obtained good evidence. Knowing that Sir Walter Elliot, during his long residence in India, had superintended the execution, by native artists, of a multitude of coloured drawings of animals belonging to all groups, and thinking it probable that there might be amongst these some coloured sketches of *Gongylus*, he applied to him for the loan of any drawings of Orthoptera he might still have in his possession, a request to which Sir Walter Elliot, with his usual generosity, at once acceded. Amongst these Mr. Wood-Mason had found a coloured drawing of the under surface of *Gongylus gongylodes*, which conclusively proved that the insect is coloured so as to resemble a flower with a *white* corolla, thus differing remarkably from the other species, in which the prothoracic shield is of a pale bluish violet inclining to mauve, and acquiring a reddish tinge towards the margins. Both species have the same black-brown transverse prosternal blotch. *G. gongylodes* was restricted in its distribution to the neighbourhood of Bangalore in Mysore and Ceylon; one specimen, however, is in the National Collection from the Dharwar district South Mahratta country, obtained many years ago by Sir Walter Elliot himself. *G. trachelophyllus*, on the other hand, was only known to Mr. Wood-Mason from Midnapur, from the base of the Karakpur Hills near Monghyr. In 1871 he had received a specimen from Pegu, which was obtained by the late Mr. S. Kurz during a botanical tour in that

province. This specimen differed but slightly from the typical form, the colour of the prothoracic shield being a bright blue-violet, and its resemblance to a flower deceived for the moment the practised eyes of Mr. Kurz. Mr. Wood-Mason hoped before long to be able to give coloured figures of these anthomimetic *Mantidæ*.

Mr. W. L. Distant stated that Waterton recorded in his 'Essays on Natural History,' the resemblance of the rattle of the rattlesnake to an orthopterous insect, and suggested that this, by deceiving and attracting birds, might be of service to the reptile in the same manner that the floral resemblance of *Gongylus* serves to secure for these insects a supply of food.

Mrs. Randolph Clay (who was present as a visitor) exhibited a living specimen of *Zopherus Brêmei*, from Yucatan, Mexico, which had been worn by her for many months as an ornament, during which time the insect was stated to have taken no food. (See also 'The Queen,' 24th August, 1878.)

Sir Sidney Saunders exhibited specimens of *Blastophaga Psenes*, Linn., male and female, employed in the process of caprification, received from M. Jules Lichtenstein, of Montpellier. Also specimens of *Sycophaga cassipes*, Westw., from the Sycamore figs of Egypt, together with certain apterous associates corresponding with *Apocrypta* of Coquerel (but specifically distinct) recently found in the same figs.

The Secretary read a Report from Her Majesty's Consul at Taganrog, which had been sent to the Foreign Office and transmitted to the Society through the Board of Trade. The Report related to the destruction of the corn crops by *Anisoplia austriaca* in the neighbourhood of Myriapol, and in various districts in Berdiansk, Kharoff, Poltana, Ekaterinoslaff, Kherson and Bessarabia. *Cleonus punctiventris* and *Anisoplia crucifera* were also reported to be spreading in the provinces of Kiero and Podolia. The total damage done by these destructive Coleoptera is estimated at two million roubles. A Sub-committee was appointed to draw up some observations on these beetles for the use of Her Majesty's Consul.

Miss E. A. Ormerod communicated a paper "On the Prevention of Insect-injury by the use of Phenol Preparations," and exhibited drawings and specimens showing the destruction of carrot crops by *Psila rosa*.

Sir Sidney Saunders communicated a paper "On the Habits and Affinities of *Sycophaga* and *Apocrypta* from the Sycamore Figs of Egypt."

Mr. C. O. Waterhouse communicated "Descriptions of new *Telephoridae* from Central and South America."

Mr. W. L. Distant communicated "Descriptions of new Species of Hemiptera-Homoptera."

Part III. of the 'Transactions' for 1878 was on the table.—R. MELDOLA,
Hon. Secretary.

THE ZOOLOGIST.

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FEBRUARY, 1879.

[No. 26.]

ON THE AUTUMN MIGRATION OF BIRDS IN 1878.

BY JOHN CORDEAUX.

THE autumn migration of 1878 has in some respects been remarkable, and a striking contrast to that of the preceding year. In 1877-78 a very mild autumn and winter over the North of Europe, with but few intervals, and these of short duration, of severe weather, gave a prolonged and desultory character to the great southern movement. Birds came in great rushes and at long intervals, corresponding with short and very marked changes of temperature. Thus migration was prolonged throughout the winter, and indeed, from Mr. Gätke's observations in Heligoland, did not absolutely cease till the end of February, just before the return journey commenced.

The migration of the past autumn, when once began, proceeded with great rapidity and without interruption. All the returns I have obtained, both from our coast and from the eastern side of the North Sea, show that this was the case, day by day wave after wave of immigrants sweeping southward, and in such immense numbers that we may fairly suppose long ere Christmas, 1878, the dreary winter-bound north was fairly denuded of birds.

I will not go so far as to say that the character of the coming season may be always accurately predicted by the movement of our autumn migrants. The passage of birds from the north to the south is an annual and normal phenomenon; no matter what the weather is, in September, October and November the birds come; whether we see them or not depends on circumstances of wind and weather, into which it is not necessary at present to

enter. I will, however, go so far as to say that, from the character of the migration each year, when the data are sufficiently numerous and reliable, a tolerably correct forecast may be made as to the probable character of the coming winter, whether it is to be open or severe. This autumn the indications were all in favour of a winter of unusual severity.

Independently of my own notes, observations have been received from Spurn Point, Flamborough Head, the Whitby-lights, the Tees-mouth, as well as other localities on the north-east coast; also some very interesting notes from Mr. Gätke from his outpost on that old red crag in the North Sea. I will take this opportunity of thanking my correspondents in the various lighthouses and lightships for the kind assistance they have given me in these enquiries, and for the careful manner in which the papers sent them in the early autumn have been filled up. I am also greatly indebted to Mr. C. Donald Thompson, of Seaton Carew, who has spared no pains to obtain information on the Durham coast.

In the papers sent out in the autumn information was requested under the following heads:—(1) Date; (2) Number of birds and species; (3) Time when seen, or hour of striking the lantern; (4) Wind, direction and force; (5) Weather, fine or rain, clear or fog; (6) Other remarks, how many killed against glass.

Commencing with the larger Raptores, few, compared with what is often the case, have been noted. A pair of Kites seen by myself beating across the Humber marshes late in August. Two or three Buzzards in October, an immature Osprey, shot at Tathwell, near Louth, on October 11th, and a Honey Buzzard shot near Market Weighton, in Yorkshire, exhaust the list.

Short-eared Owls have likewise been very scarce. One at Spurn lighthouse, October 17th. Another seen near the Whitby light on the 20th. One passed the Tees buoy-light on the 14th, and two at Seaton on the following day, with some few others on the Lincolnshire coast. They appear to have arrived generally during the third week in October. Wind S.W. and calm.

A male Great Grey Shrike was shot at Beswick, near Beverley, on November 4th, and this is the only example I have heard of as procured anywhere on the east coast.

The immigration of the *Turdidæ* has been incessant during October, November, and the first ten days of December; immense

numbers of Thrushes, Blackbirds, Redwings, Fieldfares* reaching our east coast; and a few Ring Ouzels, as usual, coming with the Blackbirds. October 15th, Thrushes and Blackbirds from 1.40 to 3.30 A.M., flying past light at Flamborough. On the 16th, Thrushes and Chaffinches from 1.20 till 3 A.M. On the 17th, a great many Blackbirds, Thrushes and Chaffinches from 1.25 to 5.40 A.M.; wind S. to S.E., stiff, overcast. I saw the first flock of Fieldfares in North-East Lincolnshire on the 23rd. Mr. W. E. Clarke, of Leeds, who was at Spurn at the time, informs me that a considerable immigration of Fieldfares took place on the 27th and 28th, and he also observed two Ring Ouzels come in from the sea. On November 4th, 2.40 A.M., wind N.W., overcast and misty, blowing half-a-gale, six Fieldfares struck the glass of the Flamborough lantern, two suffering self-immolation. On the 8th, 9th, 10th and 11th December a great many Thrushes, Blackbirds, Fieldfares, Snow Buntings and Linnets, flying from S.E. to N.W., passed the Tees floating buoy-lightship; wind N. to E., with snow. This was the final rush from the north with the commencement of the frost and snow. From every station last autumn I find, compared with the other *Turdidæ*, a comparative scarcity of Fieldfares; the only exception appears to be North-East Lincolnshire, where we have had much above an average, the greater part, as ten to one, being young birds of the year.

Redbreasts were not nearly so numerous as during the previous autumn. Gold-crested Wrens were first seen at Spurn on October 16th, "S.E., gloomy, several through day." There was a large arrival about this date on the Holderness† and North Lincolnshire coast. On the 18th, S.E., showers, many brown Wrens were seen near the Spurn Lighthouse by Mr. Watson, the Principal.

During the last fortnight in October I was much struck by the unusual number of Great Tits, *Parus major*, in our gardens and hedgerows, also by a most extraordinary mustering of the common Blue Tit, *Parus cæruleus*—these latter in flocks in every hedgerow. My attention was also drawn to their unusual number by a friend living in an adjoining parish. I could only account for this most unprecedented gathering by supposing they were

* The species are placed in order in proportion to their relative numbers, and also some Pigeons, *Columba palumbus*.

† Mr. P. Lawton, of Easington, near Spurn Point, says, "I think never more Gold-crested Wrens"; also, "a very large quantity of Common Wrens."

migrants either from the North of England or from Europe. They were particularly numerous after the heavy gale on the night of October 30th, along with Common Wrens, Coal-Tits and Goldcrests. Subsequently having received Mr. Gätke's notes, showing the astounding numbers of both species which passed over Heligoland this autumn, there is now no reason to doubt those seen in North-East Lincolnshire in October were immigrants, and not the mere shifting of local birds from one home district to another.

There is no genus better qualified to brave the winters of high northern latitudes than the Tits. Under the cover of dense pine forests they find not only warmth and shelter, but an unfailing supply of insect-food. How intense, then, must have been the outburst of winter in the north to drive all these forest-haunting birds southward in such extraordinary numbers.

A flock of Waxwings were seen in the Denes, near Castle Eden in October, and several, I am informed, were shot.

From the first week in October to the middle of December Larks kept coming in. Always numerous,* they were last autumn especially so. At Spurn, on the 5th October, they were passing all day and night; cloudy, wind S.; twelve struck the light. At Spurn also, on the night of the 7th, large flocks of Linnets and Chaffinches, eighteen striking the lantern; and on the 12th, Starlings, fifteen striking the lantern. Also from the Tees-mouth, October 7th, "great many Larks coming from the N., flying S."

Snow Buntings were first seen at Spurn on November 7th; wind N.N.W., half-a-gale, showery. At Flamborough, on the 18th October, "some mixed with Larks." Tees-mouth, on the 5th November, "flock of twenty;" also on the 10th, "flocks flying S.W., dead to windward;" as my correspondent notes, "wind S.W., the fore part of the day a gale; middle part moderate." In the Cotes marshes I saw the first Snow Bunting on the 1st November; large flocks on the 9th and 10th. There were large flocks at Easington in the middle of November; and, on the 6th of that month, these birds crossed Heligoland in "astounding numbers." It will thus be seen that the migration of the Snow Bunting was very generally carried on in the first fortnight in November.

* Larks and Starlings invariably figure largely in the lighthouse returns.

I noticed gatherings, numbering sometimes hundreds, of Tree Sparrows during the last half of October. On the outbreak of the severe weather in December many came into the farm and stack-yards, concerting with *Passer domesticus*, with whom they appear to live on the best of terms.

As usual, immense numbers of Starlings have come in during the autumn; on the 17th, 18th and 19th of October, at Whitby (High Lights), wind S.E., all day passing the Lighthouse.

The *Corvidæ* appear to increase every year; they belong to a race that is evidently able to increase and prosper, at the expense, too, of the least-favoured and protected races. Mr. Gätke, in a recent letter, speaking of *Corvus cornix*, says, "Of the legions that pass over in October and November, you can form not a shade of an idea of their numbers, and considering that all these ugly brutes have been feeding on the plunder of all the poor little birds' nests, it is not to be wondered at that these latter decrease, but rather a miracle that any survived. * * * With all my heart I wish that your gamekeepers might succeed in strichnining nine-tenths of them."*

On November 7th I noted Daws in small parties, and Rooks—eight to ten and twenty—coming in, flying from N.E. to S.W. This continued from 10.30 A.M. to 1 P.M.; on the morning of the 9th, also, Rooks still coming in from the sea. At Flamborough, on October 20th, "Rooks, Jackdaws, and some Dun Crows flying towards south all day; S.S.E., overcast and misty." *Corvus cornix*, during the last half of October and in November, is noted at various stations. The Starling, Hooded Crow, Rook and Daw are each year steadily increasing as immigrants from the north.

A Great Spotted Woodpecker was shot near Withernsea about October 29th. Kingfishers have been very common in our marshes after August. A Fern Owl, a female, was shot near Easington on October 23rd; the stomach was filled with small Coleoptera. Immense flocks of Wood Pigeons appeared in November in North Lincolnshire, visiting by thousands the turnip-fields and the young clover plants. Wood Pigeons, I have observed, invariably fly very high when migrating.

Before the outbreak of the severe weather, commencing with December 8th, enormous flocks of Golden Plover and Lapwing

* I quite agree with Mr. Gätke's remarks, but would extend the remedy to the whole race of egg-sucking *Corvidæ*.

frequented the semi-flooded marshes; within a few days after the breaking out of the frost and snow all had departed, and not a solitary bird of either species was to be seen. The Wood Sandpiper was shot at Spurn in August, and a Grey Phalarope, a male, at Filey on November 9th.

The first Woodcock was seen at Spurn on October 1st; wind N.N.W., drizzly. Several arrived on the 17th, and again on the 30th. On November 2nd a Woodcock struck the low light at Spurn at 3 A.M.; wind N.N.W., rain. On the 5th two Woodcocks passed the Tees floating-light,—wind N.E. by E., strong breeze,—and again on the 8th and 20th. Great numbers appear to have crossed Heligoland during the last week in November.

Large flocks of waders, as Curlews, Dunlins, Grey Plovers, and Redshanks appeared on our coast as early as the middle of August. Snipe during the autumn have been abundant. Jack Snipe scarce; in proportion to the former as one to ten or twelve. Amongst the immigrants which arrived in our east-coast marshes early in November were several Water Rails.

The return from the Tees buoy-lightship throughout the whole of October and November shows a large arrival of the *Anatidæ* on the coast, comprising Wigeon, Mallard, Teal, Golden-eye, Sheldrake (twenty-five to twenty-seven in a flock), Shovellers, Scoters, and Wild Geese; also some Divers. The same has been the case in the Humber, where we have had in the later autumn an extraordinary arrival of various ducks, geese, and some swans. After the heavy gale from the N.W. on the night of October 30th, several Little Auks were driven on the coast and inland. At this time one was picked up alive in the town of Grimsby.

Mr. Gütke has supplied me with the following autumn notes from his outpost in Heligoland—that storm-swept crag in the North Sea. They are so remarkable that I give them in full:—

“October 1st. S. and S.E. During night great numbers of migrants passing Lighthouse. *Turdus torquatus* and *musicus*, and of *iliacus* a great many (too early); *Anthus Richardi*, *pratensis* and *rupestris*; *Sylvia phœnicurus*, *trochilus*, *rufa*, and one *locustella*; *Falco peregrinus*, *asalon* and *nisus*.

2nd. N.W. and N.N.W., windy, showers. *Phylloscopus superciliosus*, one in my garden; *Corvus cornix*, great multitudes; also of *Sturnus vulgaris* (old birds).

3rd. S.W.—W. *Sturnus*, great many; *Fringilla cœlebs*, *montifringilla*, *cannabina* and *linaria*; *Parus major* and *cæruleus*; *Reguli*; *Emberiza lapponicus*.

October 4th. S.W., windy. Nothing.

5th. S.E., clear. During night lots of Larks, Thrushes, Plovers and Peewits. *Anthus Richardi*, one shot; *Alauda alpestris*; *Parus cæruleus*, a great many; *P. major*, less.

6th. S.E., strong. *Parus cæruleus*, a great many; *Sylvia rufa* and *trochilus*; *Alauda alpestris*.

7th. S.—S.W.—W., warm and still. *Corvus cornix*, a great many—tens of thousands; *Parus cæruleus*, astounding numbers; *P. major*, many; *Sturnus vulgaris*, a great many old birds; all the *Fringillidæ*; *Accentor modularis*; *Turdus musicus*, pretty numerous; *T. iliacus* and *merula*, less; *Sylvia rubecula*, many; *S. rufa*, less; *Anthus pratensis* and *rupestris*, pretty many; Woodcocks, some.

8th. S.S.E.—S., clear, windy. The same as the day before; Starlings, many thousands; *Parus caudatus*, fifteen to twenty; *Hirundo rustica*, a great many young birds during the afternoon.

9th. W. *Phylloscopus superciliosus*, one seen during the last four days, probably the same. *Emberiza pusilla* in my garden.

10th, 11th, 12th. S.W.—W.—N.W. *Sterna Dougallii*, a young bird; scarcely anything besides.

13th. W.—S.W., clear, fine. *Muscicapa parva*, shot one in my garden; Hooded Crows and Starlings by tens of thousands; *Turdus merula*, *musicus* and *iliacus*, not many; *Fringillidæ* and *Anthidæ*.

14th. Calm, later S.E.—E. and E. by N., clear and warm. *Corvus cornix*, by thousands, high; Starlings, hundreds of thousands from 8 to 11 A.M., from 50 to 250 feet high, flying in circles, like Swallows catching insects on wing. I have never before seen this done by Starlings. *Alauda alpestris*, many; *Fringillidæ*, many; *F. coccothraustes*, one.

15th. E.S.E., strong. *Corvus cornix* and *Sturnus*, a great many; *Corvus monedula*, many; *Alauda arborea*; *Parus major* and *cæruleus*.

16th till 20th. E. by S. The lower shattered clouds S.E., higher clouds (more solid) S., the highest W. by N. *Corvus cornix*, in great numbers, coming from N.E., and some northerly.

20th. Westerly wind. *Corvus cornix* and *Sturnus*, tens of thousands; nearly nothing else.

21st. E., fresh. *Anthus Richardi*, four; *Turdus merula*, *musicus* and *iliacus*, few; Woodcock, daily some.

22nd to 23rd. S.W., rain. Nothing whatever.

24th till 30th, stormy. *Phylloscopus superciliosus*, one seen in trees at steps; *Parus ater*, one.

30th. W. and N.W., stormy. *Emberiza pusilla*, one; *Corvus cornix* and *Sturnus*, many; *Alauda alpestris*, pretty many; *Fringilla montium*, *chloris* and *montifringilla*, great numbers; *Regulus flavicapillus*, pretty large numbers.

31st. In the morning E., changing all round, but very quiet. *Falco gyrfalco*, one; *Corvus cornix* and *Sturnus*, many thousands; *Alauda alpestris*, a great many; *Sylvia rubecula* and *atricapilla*, many; *Parus major* and *cæruleus*, many; *Scolopax* and *Turdus*, not many.

November 1st, 2nd and 3rd. N.W., high wind. *Corvus cornix* and *Sturnus*, still thousands; *Scolopax* and *Turdus*, a few; *Regulus flavicapillus*, *Parus major* and *cæruleus*, many; *Falco peregrinus*, some; *F. gyrfalco*, one on the 3rd; *Emberiza nivalis* and *alpestris*, great numbers.

4th. N.E., cloudy. *Falco albicilla*, several; *Corvus cornix* and *Sturnus*, again thousands; all the *Fringillidæ*, and *Parus major* and *cæruleus*; *Emberiza nivalis*, many.

5th. N.N.E., rain, wind and hail. Nothing.

6th. S.E., rain, up to 12th. *Turdus varius*, stated to have been seen; *Turdus pilaris*, many; *Emberiza nivalis*, astounding numbers.

Storm from Nov. 8—10.

12th. S.—S.W.—W. *Parus caudatus*, four; *Regulus flavicapillus*, some after the wind, having blown from 9 to 10 during night.

15th. S.E., cloudy and windy. *Corvus cornix* and *Sturnus*, a few; *Parus cæruleus* and *caudatus* and *Regulus flavicapillus*, some.

16th and 17th. Storm from the S.E. and S.

17th, wind quiet, East, dark. *Charadrius squatarola*, at 9 A.M. thousands on thousands overhead, passing over; *Scolopax gallinago*, many.

18th, 19th. E., quiet. *Alauda alpestris*, flights of twenty; *Emberiza nivalis*, many; *Corvus cornix* and *Sturnus*, in flights of from twenty to fifty.

20th, 21st. S.S.E., quiet. *Alauda alpestris*, *Emberiza nivalis*, *Parus cæruleus* and *major*, some; *Fringillidæ*, every day, more or less; *Sylvia rubecula*, daily.

21st and 22nd, during night S. *Turdus*, *Vanellus*, *Charadrius auratus*, *Scolopax rusticola* and *gallinago*, passing overhead in numbers.

25th. S., fog, quiet. A few of the above.

26th. S S.W., windy and raining. During night, passing overhead:—*Alauda arvensis*, *Emberiza nivalis*, *Turdus merula*, *pilaris* and *iliacus*, *Numenius* (great many), *Charadrius auratus*, *Tringa alpina*, *Scolopax gallinago*, Herons and lots of various unknown, all in great numbers. Several Woodcocks caught during night near Lighthouse.

27th. Quiet, foggy; evening N.E. Woodcocks, shot about a score. During night again all the above overhead, passing over.

28th. N.E. *Alauda alpestris* and *Fringilla montium*. During night again a great host of all waders, &c., passing overhead.

29th, 30th. N.E. *Pyrhula vulgaris*, three, some caught; have not been seen here for a great many years. *Fringilla carduelis*, some; Woodcocks, some. During night again great numbers overhead."

The following notes have been sent by correspondents. I give them as nearly as possible in their own words:—

Tees 5th Buoy-lightship, June 9th, 1878. — “Two Sheldrakes with sixteen young ones with them came close to the light; they appeared to have been hatched that morning, as they were very small.”

The same, July 31st, 1878.—“Light breeze from the N.E. and cloudy. Observed a great many Sea Swallows [*Sterna minuta*] in the Tees this day; some of them have black heads—some are as small as Larks. There was a ‘Chaser’ [probably *Lestris parasiticus*] with them; it is a dark brown bird. When the ‘Swallows’ caught a sprat the Chaser would fly after them and take it from them; they never fish themselves. Seamen call them ‘Boatswains.’”

January, 1877.—“About the middle of this month a very fine Cormorant, with top-knot, came to the Light, which I caught and kept all night. Next morning I let it out, and it flew away; but at 4 P.M. it returned, and I threw it some small fish, which it seemed to enjoy; it roosted on the Light. After that its visits became regular, and it got very tame. I did not take particular notice how many weeks, but for some considerable time it kept this practice up, when all at once it disappeared.”

March 30th, 1878.—“Strong wind from the W.N.W. to N.E., with snow storms and a heavy sea running. I observed a large flock of Cormorants come into the Tees at 4 P.M.; one came to the Light and roosted all night, and at 7 A.M. left; however, at 4 P.M. it returned, and as it roosts on the same place and appears very tame and quite at home, I concluded it was the same bird which came in 1877. I feed it with small fish; it does not like strangers, and when they come to the Light it leaves. The end of this poor bird I heard in July; it was shot on Seaton Snook by a puddler or some other gunner.”

It is worth remarking that I got a young Chiffchaff on the 10th December. It flew into a friend's room on the 7th, and killed itself against the glass. This is a very late occurrence for this bird in North Lincolnshire.

An interesting occurrence at Spurn was a small flock of Siskins, seen by Mr. William E. Clarke, of Leeds. They were feeding by the roadside between Easington and Spurn, on the seed-bearing plants, and were so tame as to allow him to approach within a few feet.

NOTES FROM AN ARCTIC JOURNAL.

BY H. W. FEILDEN, F.G.S., C.M.Z.S.

(Continued from p. 24.)

After the sun left us at mid-day, which occurred on the 11th October, the twilight sensibly decreased day by day. On the 25th I noticed in my journal that at mid-day only a glow of pale amber showed in the south-east, against which the contour of the Greenland coast was just visible; the ice and hummocks in shade looked a dark purple, the flat floes white. Whilst walking, we came across the fresh tracks of a Lemming, which I followed; they crossed the ice-foot, out on to the pack, and the little animal had burrowed down through snow to a tidal-crack; its return footsteps could be traced to the land. Subsequently I daily observed traces of similar movements on the part of this rodent to the water, until it became too dark even to notice their tracks, which look like a pattern for linen embroidery, in the white snow.

On the 29th October Quartermaster Bury, when on watch, heard what he considered to be a pack of Wolves howling in the distance, and I have little doubt of the correctness of his report. Our indefatigable hunter, Dr. Moss, borrowed my snow-shoes and went some distance inland, but found no tracks of Wolves, though those of Hares were not uncommon. It must be remembered that one or two Hares when on the move will make an enormous number of tracks in snow in a few hours. Moss remarked that even if he had come across a Hare, it would have been too dark to shoot it.

From the end of October till the return of the sun in the following year, the notices in my journal which have any bearing on Natural History are so few and scattered that it is out of the question endeavouring to bring together a sequence of observations; but as the sole value of any such intermittent notices consists in the exactness of the record, I do not scruple to transfer, word for word, from my journal the few items which may be considered to bear on the subject:—

“October 31st.—Hauled up the net, containing a dog, which had been let down to the bottom of the fire-hole, a depth of ten fathoms; though it had only been in the water six days, the

flesh was nearly cleaned off the bones by the shrimps. Some hundreds of these crustaceans, chiefly *Anonyx nugax* and *Gammarus locusta*, came to the surface with the skeleton: exposed to a temperature of -15° F., they all died in two minutes, the temperature of the sea-water being $+28^{\circ}$ F.

November 1st.—Dr. Colan has been good enough to show me his monthly medical inspection report. Out of seventy souls on board, fifteen are under treatment for frost-bites and colds, the rest in excellent health.

2nd.—Considerable movement in the pack outside; the grinding together of the ice sounded like the roar of a great waterfall. In water taken from the fire-hole I detected a few minute copepoda. Noticed the fresh track of a Hare leading across the ice-foot and out on the pack. What can induce these animals and the Lemmings to leave the land, go to the edge of the tidal-cracks, and return to the shore, unless it be to obtain water?

4th.—A fresh breeze from S.S.E., the temperature has risen to zero; this sudden rise is most oppressive: I can honestly affirm that after a short walk, Egerton, Rawson and I were glad to throw ourselves down on the floe to rest and cool. Whilst working at the fire-hole this morning I noticed Bruin, a big Eskimo-dog, stagger whilst digging with his companions in the dirt-heap; he uttered a piercing yell, and started off in my direction with a half-paralyzed gait; his companions then set upon him, and worried and bit at him; I drove the savage brutes off with an ice-chisel; Bruin then fell into convulsions which lasted over five minutes; his four legs were contracted inwards, and jerked together outwards with great rapidity; foam exuded from his mouth, and a loud gurgling came from the throat; his eyes were open and fixed; gradually his legs stopped jerking: the beast remained quiet for about a minute, then rose to his feet, and ran round in circles head down; back somewhat arched; tail, which was only a stump, tucked between the legs; gait very unsteady. I had a lantern in my hand with which I had been examining the contents of the net from the fire-hole. The dog now ran round me in a circle; I changed my position five times and the dog always followed and circled round the light; in a few minutes the poor brute seemed to recover his faculties, gave a yell, and made off to a hummock, where he coiled himself up."

I have reproduced this circumstantial account from my journal because it was written down within a few minutes of the occurrence of the event, and because I was requested to make careful observations on this disease if we were so unfortunate as to meet with it. Otherwise under similar circumstances — namely, a pitch-dark day on a Polar floe, with an apparently rabid dog careering round—one might be tempted to kill the animal, which would have been a great mistake, for Bruin recovered, and next year took his place in the dog-team.

“Nov. 12th.—Only three of the Homing Pigeons brought from England are now alive, and these have been placed on the upper-deck, which is housed over with a felt awning; day and night lighted lamps are suspended in this part of the ship, so that, except for the extreme cold, it is the most cheerful spot we can find for these birds. A temperature of fifty to sixty degrees below the freezing-point does not appear to incommode them, for two of them are mating and seem quite happy, billing and cooing.

16th.—When I drew up the baited net from the fire-hole, it contained, along with other crustaceans, a dozen specimens of *Arcturus baffini*; the largest of these had the antennæ covered with young ones; there was also an annelid: all of these creatures died instantaneously when exposed to the air, the temperature of which at the time was -30° F. The difficulty of working with ungloved fingers in such a temperature is insuperable; frost-bite can only be kept off by thrusting the hands continually into the sea-water.

24th.—The two mated pigeons disappeared to-day, and the third was killed and hung up in the rigging to prevent its loss.

30th.—A small phosphorescent pleurobranch came up in the water from the fire-hole, the temperature of which was 28.2° F.

December 3rd.—There has been an extraordinary rise in the temperature to-day, coincident with a strong S.E. wind blowing up Robeson Channel: the maximum registered was $+35^{\circ}$ F. At 5.30 P.M., on a hummock elevated eighteen feet above the floe, the temperature registered $+28.2^{\circ}$ F., but during lulls of the wind it fell a degree; a foot from the surface of the hummock it registered $+26^{\circ}$ F., on the hummock itself $+19^{\circ}$ F.; a thermometer buried in a hole made with an augur two inches in the

ice + 11° F., at four inches + 8° F., and at eight inches + 3° F. The water in the fire-hole at a depth of eight feet was + 28.2° F. (the normal winter temperature). At 6 P. M., two thermometers taken simultaneously at the maintop, and four feet above the floe, gave + 24° F. for the higher, and + 21° F. for the lower level.

6th.—When out walking I heard a peculiar cry sounding from the hills; it might have been from one of our dogs chasing a Hare, but it differed from any note I have yet heard from them. It was a weird melancholy cry, and in all probability was that of a Wolf.

11th.—The moon very bright; at noon the heavens were unobscured by a single cloud. I could read a book (Darwin's 'Voyage of a Naturalist') with ease whilst walking on the floe. Cape Joseph Henry, distant twenty-five miles, was distinctly discernible. Aldrich, when travelling on the 25th September last, cut loose a bitch from his team which was constantly having fits, at a distance of some thirty miles from the ship. When Captain Markham was returning along the same route during the second week in October, this animal hung about his party, and though never approaching in the daytime, came to their tents at night, and picked up the scraps that were left out for her. She was observed on the 13th October, the night prior to Markham's sledge-parties arriving at the ship. To-night she came back and allowed Petersen to catch her. She was a mere skeleton. She did not seem shy with men, but would not consort with the other dogs. It seems probable that this animal, for the last two months, must have been stealthily visiting the neighbourhood of the ship at nights, and picking up offal; it is impossible that the products of the chase could have kept it alive. This appears to be an instance of the Eskimo-dog reverting to its wolfish origin.

22nd.—The moon disappeared below our horizon on the 19th, not to reappear till next year. It is a very joyous thought that the sun is on its way back to us. Captain Nares discovered the track of a small animal to-day on the floe, which can be nothing else but an Ermine. The temperature is — 40° F.

25th.—Very dark to-day at noon, I could not make out the letters on the title-page of 'Darwin's Voyage;' I could distinguish black and white, namely, a difference of colour between the print and the paper, but nothing more.

26th.—This has been a very dark day. At noon the title-page of my text book, 'Darwin's Voyage,' quite indistinguishable.

29th.—Distinctly lighter at noon to-day. People could be detected when moving, up to a distance of fifty paces.

30th.—We let Buchanan's water apparatus down the fire-hole to a depth of thirty-six feet; the temperature of the water was $+28.2^{\circ}$ F. For about a foot in depth from the surface of the fire-hole, even immediately after the ice has been removed, which is done every few hours, the water is found to be in a pasty semi-congealed state, and a person dipping a vessel by hand into this will dish up nothing but ice. We have, therefore, adopted the following simple arrangement to procure water:—To the bottom of a staff six or seven feet long a bottle, well corked, neck uppermost, is lashed; a string being attached to the cork, the staff and bottle being pushed perpendicularly down the fire-hole, the cork is withdrawn and the bottle fills. No time has to be lost in hurrying below deck with the bottle, for if allowed to freeze, which it does almost immediately, there is a liability of the bottle bursting. It will hardly be believed, what a difficult and painful task this daily procuring of sufficient water from the fire-hole for microscopic investigation has been for Dr. Moss and myself."

The new-year of 1876 was entered on under most favourable auspices; the health of the crew was in all respects satisfactory, and our frost-bitten comrades had nearly recovered. We certainly had every reason to be thankful and contented; our winter quarters, though completely exposed, and adopted more from necessity than selection, had so far proved safe and convenient. The ice that had formed inshore had now attained sufficient thickness to lead us to hope that, in the event of a gale moving our protecting wall of floe-bergs nearer the shore, the ship might rise on the newly-formed ice, and thus save herself from being cast on the land. This chance of being stranded was the evil we had most to dread.

A period of two months had to elapse before the reappearance of the sun, and up to that date I had very little hope of being able to effect anything in my special branch. It must not be supposed, however, that time ever hung heavily; meteorological, tidal, and other physical observations had to be constantly attended to; a certain number of hours outdoor exercise was

insisted on; school, theatricals, and lectures occupied the evenings; whilst the undeviating routine and discipline of a man-of-war insured order and comfort.

During the periods that the moon was above the horizon, owing to the usually extreme dryness of the atmosphere, she shone with greater brilliancy than we are accustomed to, in our humid climate; we were at those times able to extend our walks and see for miles around us, and though the prospect was marvellously weird and dreary, and the scene of solitude at times almost oppressive, yet there was a grandeur in the snow-clad hills and in the great frozen sea which I cannot hope to describe.

The following extracts from my journal are inserted to show that, as far as our observations go, we have no reason to suppose that any of the animals that winter in Grinnell Land hibernate. Until the autumnal darkness rendered it impossible to observe any more tracks in the snow, I noticed that Hares and Lemmings were on the move; and again in the commencement of the year, just so soon as the increasing twilight enabled us to extend our wanderings, and during the coldest periods of the Arctic year, we likewise found these animals roaming about.

“February 8th.—A beautiful calm day, the moon nearly at her full, temperature — 50°; walked to the top of the flag-staff hill; Cape Joseph Henry, a distance of twenty-five miles, showed very distinctly; continued my walk to Cape Sheridan. The planet Venus was shining brightly in the arc of twilight that showed in the south, in which same direction the other stars were invisible. Egerton came across a Hare's track to-day, the first seen this year.

10th.—Leaving the ship at meridian, with Egerton, we walked to the southward, and then ascended to the plateau, by its eastern face, as the snow appeared to be heavily drifted in the ravine. Parts of the upland were bared or only lightly drifted over with snow, but without much alteration of our intended course we were able to travel over hard snow at a very brisk pace. We reached in two hours a point overlooking Robeson Channel, mid-way between Cape Rawson and the next headland to the south. We estimated that we were four and a half miles from the ship. From this point we could see the Greenland coast distinctly: there was not a pool of water visible in Robeson

Channel; a light mist hung over portions of it, but not sufficiently dense to hide the floes and hummocks from our view. We found no trace of life on the uplands, but nearer the ship crossed a Hare's track, and also observed some small circular holes in the snow about the size of a penny-piece, at the edges of which the snow from inside had been thrown up in small particles; no foot-prints were to be seen on the surface, but the Lemmings were thus early on the move beneath the snow, no doubt peering out of their siphuncles, to see how the sun was getting along. Thus we see that with the first glimmer of dawn these little animals are awake, even supposing that they hibernate, but if they do, it cannot be ascribed to cold, for to-day the thermometer registered — 54° or eighty-six degrees below the freezing-point. We ran home very briskly, reaching the ship before 4 P.M.; our under-clothing was soaking with perspiration, but Egerton's nose and my left cheek were slightly frost-bitten.

February 11th.—Came across the tracks of a Hare which had been feeding on the buds of *Saxifraga oppositifolia*. This plant I often find in spots bared of snow by the wind, and consequently exposed to the low temperature of fifty and sixty degrees below zero; yet at the extremity of each stalk, inside of the russet-brown hair-fringed leaves, a green bud is to be found, which even the intensity of cold prevailing here fails to wither. Without this plant the Hares and Lemmings could not exist.

14th.—Whilst out walking put up a Hare, which escaped. The temperature being — 50° , I had my gun slung on my shoulder, as even through thick gloves the heat of the hands is quickly abstracted by contact with metal. This animal had been occupying a burrow in a snow-bank.

16th.—The view from Lookout Hill was very pleasing; towards the south there was a warm glow of salmon-colour at mid-day. Around the cairn were many tracks of an Ermine. I exposed my bare hands for two or three minutes, whilst grubbing up plants, and in that time they became so stiff from cold that I could not close my fingers: the temperature was ninety degrees below freezing.

20th.—The armourer shot a Hare, and Mr. Goode, the boatswain brought me in a Lemming in its winter-suit of white."

By the end of February, Lemmings were often observed by us running on the surface of the snow. When disturbed they buried

themselves with great rapidity. At this season the colour of the fur is greyish white, nearly pure white at the tips, but darkening to mouse-brown nearer the skin.

On the 2nd March, after an absence of one hundred and forty-two days, the upper disc of the sun was visible from the mizen-rigging of the ship, and at mid-day, on ascending Lookout Hill, our eyes were gladdened with a full view of the resplendent orb of day. The sun only remained for a few seconds above our horizon, but that short appearance made us feel as if we had all taken a new lease of life. During the first two weeks of March we experienced most intensely cold weather. On the 4th, our corrected thermometers registered -73° , or 105° below the freezing-point. The weather at that time being calm I had a couple of hours' walk, and ascended Lookout Hill, from whence a good view of the sun was obtainable at mid-day. Its entire sphere, a glorious golden shield, now rose above the southern highlands, and to our benighted eyes shone with a lustre that could only be appreciated by those who, like ourselves, had passed a long five months wearying for its return. During this intense cold, we did not whilst taking exercise feel any bad effects: certainly we left the ship warm and well clad, and were not exposed sufficiently long to lower the vital energy, but in ascending a hill, some six hundred feet high, I experienced no difficulty in breathing or any other annoyance, though perhaps my respiration was a trifle quicker than usual. Dr. Moss was at the same time out with his gun, rambling over the hills for four hours, and found fresh tracks of a Hare. Immediately on his return to the ship I obtained his sub-lingual temperature, which registered $99\frac{1}{2}^{\circ}$. Though of necessity we were all obliged daily to expose large surfaces of our body unprotected for a few minutes, yet in no instance were any frost-bites incurred or any inconveniences suffered. Inside of the ship, or in nautical parlance "between decks," we had to endure great discomfort from damp. The moisture in the air, from our breath, from our food and raiment, condensed on the beams, bulkheads, and sides of the ship, in fact everywhere not immediately adjacent to the stoves. Our sleeping cabins which were arranged along the sides of the ship formed condensers, the heated air of the ward-room passed into them, and the moisture deposited itself either in the form of ice, on the side exposed to the cold outside air, or in water which dripped

continually from the ceiling. Bedding, clothes, and books became saturated, and it was impossible to keep iron from rusting. To obviate this inconvenience in my cabin, I removed the dead-light in the ceiling and replaced it with a wooden shutter, through which was passed a piece of half-inch india-rubber tubing, which was then carried under the snow on deck to a convenient aperture. This pipe became a "downtake" for the outside air, and in a few minutes reduced the temperature of the cabin below the freezing-point. The moisture in the air either precipitated itself in the form of lovely snow crystals or formed solid ice, which was removed from the bulkheads. By tying a knot on the flexible tubing the down-draught of air could be stopped and the temperature raised. Until this plan was adopted it was found almost impossible to work with a microscope owing to the annoyance occasioned by the persistent drip.

(To be continued.)

OCCASIONAL NOTES.

HABITS OF THE KITE AS OBSERVED IN SCOTLAND.—On the 3rd October I clearly observed a Kite flying over a wood within a few miles of Brighton. A farmer, on whose land I was shooting at the time, told me that when he was a young man, Kites used to breed in numbers in a large wood near Canterbury. He stated that whenever he mounted to a nest he always, if possible, climbed first above it, in order to examine the contents, having once incautiously placed his hand among some half-killed snakes and vipers, which had been brought for food, and still retained sufficient life to hiss and strike at him. I should not have mentioned this circumstance had I not seen "reptiles and carrion" recorded in several works as forming part of the food of these birds; and, as but few of these writers appeared to have had much chance of personally observing the habits of the birds, I conclude that their partiality for such repulsive delicacies must have been given on the authority of continental naturalists. The British Kite of the present day, however, appears to be far more refined in its taste. In nests I have myself examined, I have found a few Squirrels and Rabbits, numbers of Grouse and Peewits, and on several occasions the young of Curlews, Ducks, and Pigeons. Grouse seem to be their favourite food. The last nest I had the chance of observing I passed several times, and on every occasion the young birds had a fresh-killed Grouse in the nest. The old birds usually have some particular spot to which they carry their prey, to

partially pluck and break up before taking to the young; sometimes it is a stump of a tree, a large moss-covered stone, or a bare mound of earth; at other times, if the immediate neighbourhood of the nest is covered with long or coarse undergrowth, they prepare the food on the branches of a tree. A few years ago, in the South of Scotland, I had a good view of a female Kite tearing a Peewit within fifteen yards of where I was concealed. She was evidently aware that something was wrong. Settling first on one branch, then on another, she kept constantly turning her head, with all the feathers erect like an owl, in every direction, now and then spitefully snatching a few feathers or a portion of flesh from the unfortunate bird. At last, before approaching the nest, she appeared to have discovered my presence; and, dropping the prey, she mounted into the air, and continued flying in circles for over three hours, uttering the whole time the most melancholy and monotonous cries. Occasionally she would swoop down to within twenty yards of my covering of branches, and hover over the spot, evidently attempting to make out what was concealed. As there appeared no chance of the old lady settling again—my object was to study the actions of the bird—I left my hiding-place, when she immediately rose in the air to a great height, and sailed out of sight. I have noticed that a Kite seldom approaches within 150 or 200 yards when anyone is in the immediate neighbourhood of their nest. From having frequently watched the young birds in the nest, I have noticed that while they believe themselves unobserved, and the old birds are absent, they appear of an inquiring and lively disposition; stretching their necks to the fullest extent, they peep and pry in all directions, shuffle round the nest, snapping at the flies and midges, and frequently spreading and flapping their wings. Before, however, the first cry of the approaching old bird is heard, they drop flat on their breasts; then, lowering their heads and throwing up the feathers on their backs, they patiently await the arrival of their food. The incessant calls of the old bird are occasionally answered by a low plaintive whistle. I have observed the same habits with young birds of this species that I have reared in captivity—lively when they imagined themselves alone, and sulky and shy when anyone was present; they, however, become more sociable as they grow older. Their disposition appears to be totally different to that of young Peregrines and Ospreys. In addition to the place where they prepare the food for their young (and which I have heard keepers style “the Kite’s dressing-table”), I believe that these birds, like Grey Crows, occasionally have some spot to which they carry their prey to consume at their leisure. I once counted the remains of over thirty Grouse under the branches of a large fir; some were only bleached and weather-beaten skeletons, and probably had lain for many months. This stock could hardly have been brought together for the benefit of the young, as the nest of the pair of birds frequenting the tree was within the distance

of a hundred yards, and contained only eggs at the time I discovered the remains of the Grouse. Mr. Cordeaux has described the persecution of the game-preservers, which has driven this species from his district, as "senseless." For my own part I should hardly consider a Kite a desirable resident in a game preserve. I can find no accurate description of the habits of our British Kite in any book to which I have access. The authors in nearly every instance copy one from the other. I know of no bird—not even the Roseate Tern or Goosander—that fades and loses its beauty to a greater extent than the Kite. The young, when it first breaks the shell has a long tuft of white hair on the head; this soon gives place to down. The eyes when first opened are dark hazel. By the time the bird is full feathered the iris becomes a pale neutral tint or dirty lavender. I mention this fact as a ponderous work in my possession gives the immature bird the same coloured eyes as the adult.—E. T. BOOTH (Brighton).

HYBRID PHEASANT AND BLACKCOCK.—On the 29th October I detected, among other game in the Plymouth Market, a hybrid between the common Pheasant and Blackcock, which had been killed a few days previously, I believe on the borders of Dartmoor. It was a young male bird, but inferior in size to an ordinary cock Pheasant, and in full moult, especially about the head and neck. Had it been allowed to live a month longer it would have been in magnificent plumage. As it is, the head and greater part of the neck resemble those of a young Pheasant, rather light in colour, but the breast and lower parts of a beautiful glossy black, with violet reflections. The wings and upper part of the back are darker than those of an ordinary Pheasant, and the general markings more freckled; the lower back and rump clouded with violet-black, similar to that on the breast; tail in shape very like that of a hen Pheasant, but not so long, altogether darker and not so distinctly barred; under tail-coverts, rusty red. In form the bird resembles the Pheasant more than the Grouse, and is very like the Shropshire specimen figured by Eyton and Yarrell, but shows the usual white spot at the insertion of the wing so observable in the Black Grouse. There is some naked skin about the eyes; the tarsi and toes are bare, with the exception of some down-like feathers just appearing in front, extending a little below the knee; thighs fully feathered. The contents of the stomach were seeds of the blackberry and wild rose, mixed with the husks of oats, a few insects, and a large quantity of gravel. I had the skin preserved and the body cooked, which proved excellent.—JOHN GATCOMBE (Durnford Street, Stonehouse).

WILDFOWL IN WEST CUMBERLAND.—On the 14th December last I saw on Wastwater three small ducks, which were evidently strangers, but was unable to identify them by moonlight. In the course of a week they were all shot, and one of them was sent to me, and proved to be a Tufted Duck;

the tuft on the head was very small. They were shy, and could only be approached while they dived. The gunner told me they remained under water for fully a minute. On the 23rd a female Goldeneye was sent to me. It was shot by one of Lord Muncaster's keepers on the River Irt, in Drizy parish. It was alone, and had been feeding upon sandhoppers. In October last I saw a Great Northern Diver on Wastwater, and have been told to-day (January 6th) it is still about the lake, though it has been frequently fired at.—CHARLES A. PARKER (Gosforth, Carnforth).

GREAT PLOVER OR THICK-KNEE AT THE SCILLY ISLES.—During the last heavy frost in West Cornwall and the Scilly Isles we had the usual immigration of large flocks of land birds, comprising the Thrush tribe, Larks, Finches, and other of our small birds. I have not been able to ascertain that any rare species of note occurred, and the only bird of interest that has come under my notice from the Scilly Isles is a good-plumaged specimen of the Great Plover or Thick-knee. This bird, as I have before remarked, seems to hold a line in its autumnal migration which just takes in the South of Cornwall and the Scilly Isles. I never knew the occurrence of this bird in Cornwall except in the winter months, its spring migration taking it just as much north above the latitude of Cornwall. Thus the species, although well known in Hampshire and Wiltshire, and spoken of by White in his 'Selborne,' is never seen or heard in the summer months in Cornwall.—EDWARD HEARLE RODD (Penzance).

BRITISH NEWTS.—From an article by M. Ferrand Lataste, in the last volume of the 'Journal of the Société Zoologique de France,' it appears that the supposed fourth species of British Newt, Gray's Banded Newt, *Ommatotriton vittatus* of Cooke's 'Reptiles,' may be altogether removed from the British Catalogue. It was first introduced into the British List by Jenyns, 1835, on the faith of some specimens found in a bottle in the British Museum by the late Dr. Gray, which, being associated with some British Newts, were supposed to have been obtained in the neighbourhood of London. Through a somewhat similar error, some specimens in the collection of the Jardin des Plantes at Paris were believed by Valenciennes to have been obtained in France, near Toul, and other examples were supposed to have been found living at Antwerp. It has thus come to pass that naturalists, copying one from another, have assigned England, France, and Belgium as the locality of this Newt. It now turns out from M. Lataste's researches that all these localities are erroneous, and that the so-called *Triton vittatus* is no other than the *Triton ophryticus* of Berthold, an Eastern species of Newt which is found in Syria and Asia Minor. The British Newts are now therefore reduced to three in number:—the

Crested Newt, *Triton cristatus*, the Smooth Newt, *Triton taniatus* (both of ordinary occurrence), and the rarer Palmated Newt, *Triton palmatus*.—‘Nature,’ 28th Nov. 1878.

LARGE PILCHARD.—On December 28th I measured the largest Pilchard I ever saw. It was in a salted condition, and it may therefore when fresh have been a little longer and not quite so deep as I found it. It measured eleven inches and six-eighths over all in length, and two inches and three-eighths in depth. These measurements will be found to be those of a large Herring. I did not, of course, weigh the specimen. It was one of a mixed lot of English and Irish fish, so that I cannot determine the place of its occurrence.—THOMAS CORNISH (Penzance).

VITAL TENACITY OF *Succinea putris*.—I forward a few specimens of a small form of the Amber Snail, *Succinea putris*. The chief interest lies in a peculiar habit which I have observed in the species. During the warmer months the usual habitat of this little mollusk is a sluggish watercourse, which conveys water from the reclaimed meadows above. At the outlet there is a flood-gate to prevent the ingress of sea-water. The colony of *Succinea* resides at the water's edge, a few yards *below* the flood-gate. The only molluscos companion is a finely striated small var. of *Ancylus fluviatilis*. During the *neap-tides*, both species live undisturbed in fresh water; but in the *spring-tides* they are subjected for a few hours, night and day, to a brisk influx of salt-water. *Ancylus* is a permanent resident,—attached to submerged stones; but *Succinea* is migratory. I revisited the locality on the 4th of November. Not a single specimen of *Succinea* was to be found at the water-side. Within a few yards of the ditch runs a mortar-built wall of limestone, about five feet high, and coped with stones set edgewise, at short intervals. On searching the wall for small species of land-shells I was surprised to find the colony of *Succinea*, alive and active, in small groups at the bases of the copings; some were concealed beneath moss, others under pieces of mortar. The locality was again visited on the 29th November, but there was not a *Succinea* on the wall; and its hybernaculum is a mystery. The specimens now sent were taken from the wall on the 4th of November, and subjected to a rigid experiment. They were enclosed without water, in the dry glass tube, wherein they were kept on a warm mantelpiece till this morning (December 9th). They were then transferred to a jar of fresh water. In half-an-hour the liberated prisoners were crawling up the sides of the jar, some attempting to escape.—THOS. GOUGH (Arnbarrow, Milnthorpe).

DEATH OF THE MARQUIS OF TWEEDDALE.—By the death of the Marquis of Tweeddale, which occurred at Chiselhurst on December 29th, zoological science has sustained a sad loss. Having only succeeded to the peerage on the death of his father so recently as October, 1876, his lordship was perhaps better known to naturalists as Viscount Walden, under which name he published numerous valuable contributions to Ornithology in the 'Transactions' and 'Proceedings' of the Zoological Society, in the 'Ibis,' the 'Annals and Magazine of Natural Society,' and other journals devoted to Natural History. Amongst his later publications may be specially mentioned his contributions to the Ornithology of the Philippines, which have appeared at intervals in the 'Transactions' above mentioned. Having passed some time in India, where he acquired his taste for Ornithology, and possessing a considerable knowledge of the Asiatic avifauna, his lordship had been occupied for some time before his death in investigating the Ornithology of the Philippines, until then comparatively little known. Friends and agents in this group of islands furnished him at intervals with large collections of bird-skins, and these he described in a series of valuable papers, illustrated with coloured plates of the new and rare species. It was no secret amongst ornithologists, we believe, that for some years past Lord Tweeddale had been engaged in collecting materials for a history of the birds of India, for which undertaking Jerdon's valuable work had paved the way, and furnished, as it were, the skeleton or groundwork; and, unless we are mistaken, considerable progress had been made with the MS. at the time of his lordship's lamented decease. As another instance of his devotion to the cause of his favourite science, we may mention the warm interest which he took in the publication of Mr. Dresser's 'Birds of Europe,' and the important aid which he furnished to that work in preparing a considerable portion of the synonymy. His valuable zoological library and large collections of birds at Chiselhurst were always available for inspection by his naturalist friends, to whom he was ever ready to impart information when required. Working thus energetically himself, and assisting and encouraging others to work also, Lord Tweeddale, as President of the Zoological Society, was emphatically "the right man in the right place." He was a Fellow of the Royal and Linnean Societies, and a distinguished member of the British Ornithologists' Union, to whose quarterly journal, 'The Ibis,' he contributed many valuable articles. His loss will be much felt by a large circle of naturalists and men of science, to say nothing of the numerous private friends by whom he was surrounded. His death, at the age of fifty-five, was occasioned, we are informed, by a combined attack of bronchitis and congestion of the lungs.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

December 19, 1878.—Prof. ALLMAN, F.R.S., President, in the chair.

Messrs. F. M. Campbell (Hoddesdon, Herts), J. Laurence Hamilton (Gloucester Terrace, Hyde Park), and J. J. MacAndrew (Ivybridge, South Devon), were elected Fellows of the Society.

A short paper consisting of a description of some rare shells by Mr. Sylvanus Hanley was read. *Melania Limborgi*, from British India, and *Leptomya gravida*, of uncertain habitat, were specially referred to as being unusual in several respects.

The President made a verbal communication "On the Relations of *Rhabdopleura*," expressing the opinion that the very anomalous characters of this curious Polyzoal genus admit of being derived from the typical conformation of a polyzoon by certain easily understood modifications. One of the most puzzling of those characters is the apparent absence of an endocyst, which necessarily brings with it the absence of a tentacular sheath. He pointed out that the endocyst is really represented by the contractile cord, which seems to take the place of the funiculus in the freshwater Polyzoa, but with which it has nothing to do. In *Rhabdopleura* the endocyst has receded from the ectocyst, and in its posterior part by the approximation of its walls, and the consequent nearly complete obliteration of its cavity has become changed into the contractile cord. Anteriorly it spreads over the alimentary canal of the polypide to which it becomes closely adherent, and here represents the tentacular sheath. Still more posteriorly the endocyst undergoes even greater modification, for the contractile cord becomes chitinized and converted into the firm rod which runs through the stem and branches over all the older parts of the colony, and which still presents in its narrow lumen a trace of the original cavity of the endocyst. The shield-like appendage which is attached to the lophophore is one of the most remarkable features in the genus. G. O. Sars regards it as representing the epistome of the Phylactolomatous Polyzoa; but this view is entirely opposed by the history of its development. Prof. Allman, by tracing its development in connexion with that of the polypide, has arrived at the conclusion that it is formed as a primary bud, from the modified endocyst, and that in its turn it gives origin to a bud of the second order, which becomes directly developed into the definitive polypide. The primary or scutiform bud continues for some time to increase in size with the developing polypide, which it considerably exceeds, but is at last surpassed by the latter. It never disappears, however, but ultimately remains in the condition of a subordinate appendage of the polypide to which it had given origin. We have thus in the life-history of *Rhabdopleura* an alternation of heteromorphic zooids. The first term, however, in

the genetic series, the direct product of the sexual system, is as yet wanting, no trace of this system having hitherto been discovered in *Rhabdopleura*.

January 16, 1879.—W. CARRUTHERS, F.R.S., Vice-President, in the chair.

Messrs. George Brooke (Huddersfield), Arthur Pearce Luff (Marylebone), John Edward Griffiths (Bangor), Charles Sharpe (Liverpool), and John Woodland (Kilburn Park), were balloted for and duly elected Fellows of the Society.

No zoological communications were made at this meeting, but the following botanical memoir was read, *viz.*:—"A Synopsis of *Colchicaceæ* and the aberrant Tribes of *Liliaceæ*," by J. G. Baker.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

January 14, 1879.—Professor NEWTON, M.A., F.R.S., Vice-President, in the chair.

Before proceeding to the usual business the Chairman called attention to the great loss which the Society and Zoological Science had sustained by the recent death of their late President, the Marquis of Tweeddale, F.R.S.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of December, 1878, and called special attention to a collection of Lemurs brought to England by Mr. George A. Shaw from the province of Betsileo, in Central Madagascar, and acquired by the Society partly by purchase and partly by presentation; and to a female Punjaub Wild Sheep, *Ovis cycloceros*, presented by Colonel W. R. Alexander, having been obtained in the hills between Upper Sind and Beloochistan.

Dr. Traquair exhibited a specimen of the Hackled Pigeon, *Alectanas nitidissima*, recognised last September in the Museum of Science and Art in Edinburgh, by Professor Newton, who made some remarks on the species, showing that it was peculiar to Mauritius; that it is now wholly extinct; and that only three specimeus of it are known to have been preserved.

The Secretary read an extract from a letter received from Commander Hoskins, R.N., of H.M.S. 'Wolverine,' on the subject of the range of the Mooruk, stating that no traces of the existence of this bird could be found in New Ireland. An extract was also read from a letter, addressed to the Secretary by the Rev. George Brown, giving additional particulars on the same subject

The Secretary read an extract from a letter addressed to him by Mr. R. Trimen, of Cape Town, on the subject of the true locality of the

Black Spurwinged Goose, *Plectropterus niger*, which he had ascertained had been brought to Cape Town from Zanzibar.

A communication was read from Dr. Morrison Watson and Dr. Alfred H. Young on the anatomy of the Spotted Hyæna, *Hyæna crocuta*.

A communication was read from Mr. A. D. Bartlett, giving an account of the habits and changes of plumage of Humboldt's Penguin, as observed in a specimen which had been recently living in the Society's Gardens.

A communication was read from Dr. O. Finsch, containing an account of a collection of birds, made by Mr. Huebner on Duke of York Island and New Britain.

A communication was read from Mr. Edward J. Miers, describing a collection of Crustacea, made by Capt. H. C. St. John, R.N., in the Corean and Japanese Seas. The present paper related to the Podophthalmia of the collection, of which groups twenty-six species were described as apparently new to science.

A communication was read from Count T. Salvadori, containing critical remarks on Mr. Elliot's paper on the Fruit Pigeons of the genus *Ptilopus*, lately published in the Society's 'Proceedings.'

A communication was read from the late Marquis of Tweeddale, containing the twelfth of a series of contributions on the Ornithology of the Philippines. The present paper gave an account of the collections made by Mr. A. H. Everett in the Island of Basilan.

Dr. A. Günther gave an account of the Mammals, Reptiles and Batrachians recently collected by Mr. Everett in the Philippine Islands, and called special attention to a new form of Snake of the family *Calamariidæ*, of which one example had been obtained. This Snake, which was remarkable as possessing no external rudiments of eyes, was proposed to be called *Typhlogeophis brevis*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

December 4, 1878. — H. W. BATES, Esq., F.L.S., F.Z.S., President, in the chair.

Mr. T. P. Newman, of 7, York Grove, Peckham, was ballotted for and elected a Member. Mr. J. Walker, R.N., of Blue Town, Sheerness, was ballotted for and elected a Subscriber.

Mr. H. T. Stainton exhibited a series of fine specimens of *Glyphipteryx Schænicolella* taken by Mr. Threlfall near Witherslack last summer. They were flying over cotton-grass in little swarms just before sunset—literally by hundreds—and were mistaken at the time for *G. Fischieriella*. The species was first recorded by Mr. Thomas Boyd in the 'Entomologists' Weekly Intelligencer,' vol. iv., p. 144.

Mr. Wood-Mason exhibited and made remarks upon a stridulating beetle belonging to the *Rutelidæ*.

Prof. Westwood exhibited a male specimen of *Epinephela Tithonus* having the right hind-wing much paler than the general ground colour of the other wings; likewise a variety (gynandromorphic) of *E. Jurtina*, viz., a male specimen, having the under side of the left hind-wing partly male and partly female in character, the two portions being separated by an orange streak, and presenting the appearance of a male wing with a portion of a female wing let in. An enlarged coloured diagram of the last insect was exhibited, and also similar diagrams of the following specimens:—(1). A male *Perrhybris Pyrrha* (from Mr. Hewitson's collection) having the under side of the right hind-wing coloured like the female, which mimics a species of *Heliconia*. (2). A specimen of *Nymphalis Populi* with larval head. (3). A specimen of *Dytiscus marginalis* (original in British Museum) with larval head, and one of *Helophilus pendulus* similarly deformed, two specimens of this last example of imperfect development being in the Hope Collection at Oxford.

Prof. Westwood remarked with regard to monstrosities that although in such cases among the higher animals the head parts often appeared duplicated, this very rarely appeared among the Arthropoda. He was inclined to regard gynandromorphism as the result of the coalescence of two ova in the female insect, and the subsequent suppression of all the characters of the one sex but those retained in the imago.

Mr. H. T. Stainton raised the question whether many cases of gynandromorphism might not be explained by atavism, *i.e.*, by partial reversion to ancestral characters.

Mr. M'Lachlan exhibited a series of cases of the larvæ of Trichopterous insects forwarded to him by Dr. Fritz Müller, of Blumenau, Santa Catharina, Brazil. Several of the forms, of minute size, were evidently those of *Hydroptilidæ*.

Dr. Fritz Müller also sent enlarged outlines of the neururation of various Lepidoptera, in order to point out the homologies that appeared to exist with that of the Trichoptera, of which an outline of the wing of *Glyphidotaulius*, copied from Kolenati's 'Genera et Species Trichopterorum,' was placed side by side with those of the Lepidoptera. Mr. M'Lachlan called especial attention to the neururation of *Castnia Ardalus* as delineated by Dr. Müller, and compared it with that of *Hydropsyche* as figured in his 'Revision and Synopsis of European Trichoptera.' He stated that it had long been his opinion that in a linear arrangement the orders Lepidoptera and Trichoptera should not be widely separated.

The Rev. A. Eaton exhibited a piece of "Kungu cake" from Lake Nyassa. According to Livingstone and others this substance is used extensively as food in the region referred to, and is made by the natives of large quantities of a minute insect, whose habit is to fly in dense cloud-like flights often similar in appearance to columns of smoke. These subsiding

upon the herbage along the borders of the lake, accumulate to a considerable depth, and are then collected *en masse*, pressed into cakes, and dried for consumption. Until now the "Kungu fly" has been conjectured to be a species of the *Ephemeridæ*; but on actual inspection it proves to be a minute representative of the *Culicidæ*, and (so far as can be ascertained from the material at hand) of the genus *Corethra*. The condition of the compressed examples precludes an exact determination of the species being made from them. It is possible that "Kungu cake" in other localities may be composed of other materials.

Mr. W. L. Distant remarked that he had learnt from Mr. Chennell that *Erithesina fullo*, a very common Eastern Hemipterous insect, was largely eaten by the Naga Hill tribes of N.E. India.

Mr. Meldola stated that while on the subject of insect-food he would mention that Mr. S. Stevens had forwarded to him a query by Mr. J. Watson respecting the chemical composition of the bodies of insects, which, since they furnish all the materials necessary for the food of those birds which, like swallows, feed on the wing, must contain, in addition to carbon, hydrogen, and oxygen, the requisite nitrogen and phosphates. Mr. Meldola remarked that chitine, the substance composing the horny external portions of the bodies of insects, had been shown by analysis to contain about 6 per cent. of nitrogen. With regard to phosphates he stated that, although he was sure the ash of the bodies of insects did contain these salts, he was unable to find any direct statement to this effect, and at his request, therefore, Mr. William Cole had been good enough to burn some insects, and to test the ash for phosphoric acid, which he had succeeded in finding.

Mr. C. O. Waterhouse forwarded for exhibition a living *Curculio* found by Mr. J. C. Bowring in his orchid-house at Windsor. The insect was identified by Mr. Pascoe and Professor Westwood as one of the *Calandridæ*.

The Secretary read the "Report of the Sub-Committee appointed to consider the communication from the Board of Trade, dated 2nd November, 1878, regarding the ravages of *Anisoplia austriaca* at Taganrog."

Mr. A. G. Butler communicated a paper "On a collection of Lepidoptera from Cachar, N.E. India."

Annual Meeting, January 15, 1879.—H. W. BATES, F.L.S., President, in the chair.

Mr. J. W. Dunning, one of the Auditors, read an abstract of the Treasurer's Accounts for 1878, showing a balance of £30 14s. 7d. in favour of the Society.

The Secretary read the Report of the Council for 1878.

Mr. M'Lachlan proposed and Mr. Wood-Mason seconded the adoption

of the Council's Report. The motion was put to the Meeting and carried unanimously.

An address was delivered by the President.

Sir Sidney Saunders and Mr. E. Boscher were appointed scrutineers.

The following Members of Council were elected for 1879:—Henry Walter Bates, F.L.S., F.Z.S.; William L. Distant; Rev. A. E. Eaton, M.A.; Edward A. Fitch; Ferdinand Grut, F.L.S.; Raphael Meldola, F.C.S.; Edward Saunders, F.L.S.; Frederick Smith; J. Jenner Weir, F.L.S., F.Z.S.; Joseph W. Dunning, M.A., F.L.S.; Sir John Lubbock, Bart., M.P., V.-P.R.S.; Samuel Stevens; James Wood-Mason, F.G.S.

The following officers were then elected:—President, Sir John Lubbock, Bart., M.P.; Treasurer, J. Jenner Weir; Librarian, F. Grut; Secretaries, R. Meldola and W. L. Distant.

Mr. H. T. Stainton proposed a vote of thanks to the President for his services during the past year, and moved that his address should be printed. The motion was seconded by Mr. M'Lachlan, and carried unanimously.

A vote of thanks to the other officers for their services was proposed by Mr. J. W. May, seconded by Mr. Pascoe, and carried unanimously. Messrs. Jenner Weir, Grut, Meldola, and Distant replied.

The President returned thanks to the Auditors, on whose behalf Mr. Dunning replied, and the Meeting then adjourned to February 5th.—
R. MELDOLA, *Hon. Secretary.*

NOTICES OF NEW BOOKS.

The Fenland Past and Present. By SAMUEL H. MILLER, F.R.A.S., F.M.S., Medallist and Foreign Member of the Society of Arts and Sciences of Utrecht; and SYDNEY B. J. SKERTCHLY, F.G.S., Her Majesty's Geological Survey. Illustrated with Engravings, Maps and Diagrams. Wisbech: Leach & Son. London: Longmans. 1878. Royal 8vo.

Now that in these days when "men run to and fro upon the earth, and knowledge is increased," the aspect of few parts of England is not more or less known to our readers. A gloomier prospect is hardly to be viewed by a traveller than that which presents itself to the eyes of the ordinary passengers on certain portions of the Great Northern or Great Eastern Railways, where the line runs over the Fen Country. The ground is a dead level; the soil black; hedgerows, and still more the graceful elms which in so many parts of the kingdom embellish them, are wholly

wanting. Field is separated from field by ditches half-choked with weeds. The horizon is broken only by straggling plantations of alders and black poplars. A few willows here and there cluster in a corner which seems to have escaped the attention of the agriculturist. As we come to a halt at one of those lonely stations—

“Where none but a Great Eastern train would stop,
Where there’s no one to pick up and no one to drop”—

we marvel how people can be found to dwell in the midst of such a melancholy district. In spring or early summer, indeed, our ears may catch the chattering notes of the Sedge-bird or the feeble song of the Reed Sparrow, but at all other seasons of the year silence reigns; and the traveller, if he be passing through the country for the first time, wonders whether he may have inhaled the germs of an ague, and whether the stories he may have heard as to the opium-consuming habits indulged in by the Fen men to prevent that dire malady are true or not. Such are probably the thoughts presented to ninety-nine out of every hundred even intelligent passengers through a considerable portion of Huntingdonshire, Lincolnshire, Cambridgeshire and Norfolk. But the one man out of the hundred will know that the landscape he views was not always as he sees it, and that its present condition has been brought about at an expense of money and life and labour which no one can compute, and that it may be regarded as one of the greatest triumphs of the human intellect over the concurrent forces of nature—for has he not read Mr. Smiles’s ‘Lives of the Engineers’?

It is impossible to doubt the fact that this wide expanse, so unlovely, so repulsive—we may almost say—in its present state, was once an absolute paradise, abounding in animal life and diversified by vegetation, the nature of which we can hardly conceive. Yet if we turn to what is recorded of its earlier condition we find but little to satisfy our longings for information, and we must say that that little has not been made the most of by the authors of the book which has prompted these remarks. They have, it is true, and we are much obliged to them for it, given on the whole a fairly accurate, and in some respects a happy, paraphrase of that curious passage in the ‘*Liber Eliensis*,’ wherein a monk of the twelfth century depicted some of the principal features of the fen country of his time, and we may add that this is the

more to their credit, since the passage is in some parts extremely hard to translate. They quote it entire (pp. 356—358), with only two or three trifling misprints, but it deserves to be better known than it is, and we will here attempt an English version of it. We may state that it is an enconium passed upon the Isle of Ely, and supposed to have been delivered to William the Conqueror when he was laying siege to that “Camp of Refuge”;—the last portion of England which held out against his victorious arms:—

“In our isle men are not troubling themselves about the leaguer, but think they may safely be defended by their tirois; the ploughman has not taken his hand from the plough, nor has the hunter cast aside his arrow, nor does the fowler desist from beguiling birds. And yet something more. If you wish to hear what I have known and have seen, I will reveal all to you. The isle is within itself plentifully endowed, it is supplied with various kinds of herbage, and for its richer soil surpasses the rest of England. Most delightful for its charming fields and pastures, it is also remarkable for its beasts of chase, and is in no ordinary way fertile in flocks and herds. Its woods and vineyards are not worthy of equal praise, but it is beset by great meres and fens as though by a strong wall. In this isle there is an abundance of domestic cattle and a multitude of wild animals; Stags, Roes, Goats and Hares are found in its groves and by these fens. Moreover, there is a fair plenty of Otters, Weasels and Polecats, which in a hard winter are caught by traps, snares, or by any other device. But what am I to say of the kind of fishes, and of fowls, both those that fly and those that swim? In the eddy at the sluices of these meres are netted innumerable Eels, large Water-wolves—even Pickerels, Perches, Roaches, Burbots and Lampreys, which we call Water-snakes. It is indeed said by many men that sometimes *Isicii*,*

* It seems impossible at present to say what fish is here meant, though our authors translate it “Shad.” The resemblance of the word to *isicium* (a pudding or sausage) points to some kind which was commonly made into a pudding or cooked with stuffing, and Du Cange has *Isix* = *Esox*—i. e., according to the ordinary interpretation, a Pike. Now, though to this day a Pike is generally baked with “a pudding in his belly,” following the laudable example of Izaak Walton, Pike can hardly be intended in the text, for it has been already named among the commonest fishes, whereas the *Isicii* were comparatively rare. Du Cange translates *Esox* by *Alose*—the French for Shad, and our authors seem to have followed him; but we submit that their interpretation cannot be allowed. In the first place, the old name of the Shad is *Lachia*, whence comes *Alachia*, *Alausa*, *Alose*, and *Allice*, &c. (Yarrell, ‘British Fishes,’ ed. 3, vol. i., p. 128); and, secondly, no British species of Shad is possessed of such qualities as would justify its being mentioned in the exceptional way that the *Isicii* are. We may add that there can be no question of a wrong reading, as we are assured by Mr. J. W. Clark, who has kindly consulted on this point the original MS. in the library of Trinity College, Cambridge. The

together with the royal fish, the Sturgeon,* are taken. As to fowls, let us, if it be not troublesome to you, recount those which abide there and thereabout, as we have done with the rest. There are numberless Geese, *Fiscedula*,† Coots, Didappers, Water-crows, Herons and Ducks, of which the number is very great. At midwinter or when the birds moult their quills, I have seen them caught by the hundred, and even by three hundreds more or less, sometimes they are taken in nets and snares as well as by bird-lime."‡

Want of space forbids our attempting to fill up the outlines thus boldly sketched, and thus we must look in vain for another glimpse of fen zoology till we find one, of all places in the world, in the 'Ephemerides' of Casaubon, a foreigner and a scholar! This distinguished man, in 1611, accompanied Andrews, then Bishop of Ely, on a visit to part of his diocese, and the journal kept, as was his wont, shows what a remarkably acute observer he must have been. As Mr. Pattison, the editor of an excellent memoir of him ('Isaac Casaubon, 1559—1614'), says, "In this summer retreat [Downham Market], Casaubon enjoyed forty-eight days of peace and leisure. . . . The flat fen of Donnington is not a favourable specimen of our rural scenery, but Casaubon thought it beautiful, coming from S. Mary Axe. Though he had lived at Montpellier, he thought the apricots of the Isle of Ely rivalled those of France in flavour. He was struck with the wealthy appearance of the country. He saw something of provincial life, accompanying the Bishop on a progress or visitation, which he made to Wisbech and the neighbourhood." We will hazard another translation, of an entry made at Wisbech, on the 20th September of that year:—

historian, however, in copying from some older record (a practice not confined to monkish annalists) may have written the word wrongly, and we cannot help suggesting that there has been a corruption of some such word as *leaxas*, which would signify Salmon, possibly through this very *Lachia*.

* The word in the original is *Rumbus*, which, in its usual form of *Rhombus*, undoubtedly signifies Turbot, as our authors have translated it. But what could a Turbot be doing in the fresh waters of the Isle of Ely? The expletive of "the royal fish" points to the Sturgeon, and in the 'Promptorium Parvulorum' (the work, be it remembered, of an East Anglian) we find (Ed. Way, p. 481) "Sturione, or Sturiowne, fysche (sturgyn, K. sturiowne or storyon, S.) *Rumbus*." We therefore do not hesitate to accept this rendering here, and may remark that there are many cases of the name of an animal being diverted from its common meaning by mediæval authors.

† In the translation of this word there is again a difficulty. The most obvious suggestions are that it is a corruption of *Piscedula* or *Ficedula*; but no such name as the former is known, and the latter, "Fig-eaters," seems strangely out of place in such company. Could we read it *Querquedula*, Teals, all would be easy.

‡ Lib. ii. cap. 105 (Ed. D. J. Stewart, 1848).

"We also saw certain choice birds which are fattened for sale. Amongst the rest one called Godwit, that is to say, *Dei ingenium*, which is wonderfully commended, so that at Wisbech, where provisions are very cheap, the bird-feeder said he sold these birds for five or six English halfpence (*solidis*)—equal to fifty or sixty French—apiece, but when he took them to London he brought back twenty English pence for each. The bird is the size of a small Partridge, or even less. Its colour is grey, and it has a bill longer than my middle finger stretched out. The flesh when cooked is dark as is that of marsh-birds. I ate it at the Lord Bishop's table, and did not think highly of it: I do not see the reason why it is so greatly preferred to the *Otus*."*

What this *Otus* was may be discovered from another passage in the same journal:—

"*Blitteræ aves. Oti vel Otides.*"

"In the Ely country there is a bird about as big as a hen, in colour a mixture of yellow and grey, &c., having very long legs, and called *Blitterra*. It is said to be in the habit of introducing its bill into one of the nearest reeds, and of thundering forth a voice so horrible that those unused to the thing say it is that of an evil spirit, and so loud that two gentlemen assured me it could be heard for three or four miles. It is not agreeable meat.

"The *Otus* or *Otis*, indeed, is a bird less than a Partridge, and a mimic, wont to be beguiled and caught by silly imitation. Great men and kings are keen in the chase of this bird. It furnishes very delicate meat, if my palate is sufficiently instructed. I have also seen them alive. They say that if the fowler lifts one of his feet the bird does the same, if he extends an arm the bird extends a wing, and imitates all his actions."†

The *Blitterra* is, of course, the Bittern, and the fable of its booming, "with bill engulph't," is a very old one, perpetuated even by Thomson in the last century, though Drayton, in the extract from his 'Polyolbion' (written about this time), which our authors most properly quote (pp. 367, 368), seems to have been superior to it. But the *Otus* or *Otis* of Casaubon, as every ornithologist will perceive, cannot be anything else than the Dotterel,‡ and his statement as to its capture by kings is curiously corroborated by what we know from another source to have been one of the "sports" of James I. in the preceding year, for which we must

* 'Ephemerides Isaaci Casauboni,' &c. (Ed. Jon. Russell, ii., pp. 867, 868).

† *Op. cit.*, p. 873.

‡ Mr. Pattison, not being an ornithologist, naturally falls into the mistake of thinking it was a Bustard (*op. cit.* p. 391). We may also remark that for the same reason Mr. Russell in the penultimate passage prints "Godwie" for "Godwit," thereby failing to explain Casaubon's ingenious Latin translation of its name.

refer our readers to Mr. Stevenson's 'Birds of Norfolk' (vol. ii., pp. 82—84), as we have not room to quote it here.

We have just mentioned Drayton's 'Polyolbion,' which gives as animated a picture as well can be of Fen life*—but then again we come to another lamentable blank. The observant Ray, who lived so long on the borders of the district, and, as his 'Itineraries' show, more than once traversed it, has left us no connected account of its peculiarities, and what can be gathered from his and Willughby's writings leads us to suppose they had never made any special study of them. There is perhaps one reason for the neglect with which the Fens in their best time were treated, though we are not aware of its having been alleged before, and as it is strictly a zoological matter we may mention it now. They were doubtless most abominably infested by clouds of gnats, from which visitors would suffer torments. This is no mere supposition. We have the evidence of the younger Thomas Browne to this effect. In his tour from Norwich to Derbyshire and further, in 1662, he had occasion to cross the Wash from Lynn to Boston, and he mentions two routes. Of that which he took he writes that it was "not troubled with flies with which all those fenne countrey's are extreemly pestered."†

What would we not give to have had from that prince of faunists, Gilbert White, an account of the Fenland during his stay in it? We have long known his opinion:—"I have often thought that those vast extent of fens have never been sufficiently explored. If half-a-dozen gentlemen, furnished with a good strength of water-spaniels, were to beat them over for a week, they would certainly find more species."‡ And he had good right to give an opinion, since we learn from that interesting correspondence of his with Marsham which has only of late years been published,§ that in 1746 he "lived for six months at Thorney, in

* One especially remarkable feature is prominently brought forward in the line:—

"There stalks the stately *Crane*, as though he march'd in warre,"

reminding us of old Turner's earlier statement (in 1544):—"Apud Anglos etiam nidulantur grues in locis palustribus, & earum pipiones sæpissime vidi, quod quidam extra Angliam nati, falsum esse contendunt." Had this writer lived till the year 1878 he might have found an Englishman taking the same mistaken view (*Athenæum*, No. 2625, p. 222).

+ Sir Thomas Browne's Works, &c., edited by Simon Wilkin, vol. i., p. 23.

‡ Letter xxii. to Pennant.

§ Trans. Norf. and Norw. Nat. Society, ii. p. 152.

the Isle of Ely,"* and we know besides that in the month of June in that year he "was visiting for a week together at Spalding;"† but, alas! the only information he gives us on the fauna of the Fens is the bare statement that "there are supposed to be two sorts of eels in the island of Ely."‡

By far the best picture of the Fens known to us is that drawn by White's correspondent, Pennant, whose labours it is now-a-days rather the fashion to depreciate. He visited Lincolnshire at least three times:—first in May, 1768, when he met Mr. (afterwards Sir Joseph) Banks at Revesby Abbey, the latter's seat in that county, and "made many observations on the zoology of the country;"§ secondly, from the 27th to the 29th of June, 1769, when he rode from Chesterfield by Dunham Ferry and the Foss Dyke to Lincoln, whence he visited Spalding, and, passing near Swinesland Abbey, returned to Lincoln, proceeding northward by Glanford Bridge to the Humber;|| and thirdly, in July, 1776, when he went from Lincoln by Horncastle, Tattershall, Boston, Crowland and Castor to Peterborough.¶ In his account of the second of these visits occurs a description, which, being unknown probably to most of our readers, and not mentioned by the authors of 'The Fenland,' we take the liberty of reproducing. It probably includes the experience of both his earlier visits:—

"The fen called the *West Fen*, is the place where the Ruffs and Reeves resort to in the greatest numbers; and many other sorts of water-fowl, which do not require the shelter of reeds or rushes, migrate here to breed; for this fen is very bare, having been imperfectly drained by narrow canals, which intersect it for great numbers of miles. These the inhabitants navigate in most diminutive shallow boats; they are, in fact, the roads of the country.

"The *East Fen* is quite in a state of nature, and gives a specimen of the country before the introduction of drainage: it is a vast tract of morass, intermixed with numbers of lakes** from half a mile to two or three miles

* The circumstance which induced this statement is also mentioned in his 'Antiquities,' Letter v.

† Letter xxiii. to Pennant.

‡ Letter xl. to Pennant.

§ 'Literary Life,' p. 8. Among these observations must have been those on the heronry at Cressi, which so excited White's curiosity, and on the supposed new *Locustella*, as it was called in those days, the Sedge Warbler of modern times, the recognition of which is due to White and Pennant jointly.

|| 'Tour in Scotland,' Ed. 5, i. pp. 7—15.

¶ 'Literary Life,' p. 24.

** Our authors give (p. 150) a list of these lakes and their names from Dugdale.

in circuit, communicating with each other by narrow reedy straits: they are very shallow, none are above four or five feet in depth; but abound with fish, such as Pike, Perch, Ruff, Bream, Tench, Rud, Dace, Roach, Burbot, Sticklebacks, and Eels.

"It is observable that, once in seven or eight years, immense shoals of Sticklebacks appear in the Welland below Spalding, and attempt coming up the river in form of a vast column. They are supposed to be the collected multitudes washed out of the fens by the floods of several years, and carried into some deep hole; when, over-charged with numbers, they are obliged to attempt a change of place. They move up the river in such quantities as to enable a man, who was employed in taking them, to earn, for a considerable time four shillings a day, by selling them at a halfpenny per bushel. They were used to manure land, and attempts have been made to get oil from them. The fen is covered with reeds, the harvest of the neighboring inhabitants, who mow them annually; for they prove a much better thatch than straw, and not only cottages, but many very good houses are covered with them. Stares, which during winter resort in myriads to roost in the reeds, are very destructive, by breaking them down by the vast numbers that perch on them. The people are therefore very diligent in their attempts to drive them away, and are at great expense in powder to free themselves of these troublesome guests. I have seen a stack of reeds harvested and stacked worth two or three hundred pounds, which was the property of a single farmer.

"The birds which inhabit the different fens are very numerous: I never met with a finer field for the zoologist to range in. Besides the common Wild-duck, of which an account is given in another place,* wild Geese, Garganics, Pochards, Shovelers, and Teals, breed here. I have seen in the *East Fen* a small flock of the tufted Ducks; but they seemed to make it only a baiting place. The Pewit Gulls and black Terns abound; the last, in vast flocks, almost deafen one with their clamors: a few of the great Terns, or Tickets, are seen among them. I saw several of the great crested Grebes on the *East Fen*, called there *Gaunts*, and met with one of their floating nests with eggs in it. The lesser crested Grebe, the black and dusky Grebe, and the little Grebe, are also inhabitants of the fens; together with Coots, Waterhens, spotted Waterhens, Water-rails, Ruffs, Redshanks, Lapwings or Wipes, Red-breasted Godwits and Whimbrels. The Godwits breed near Washenbrough; the Whimbrels only appear for about a fortnight in May near Spalding, and then quit the country. Opposite to Fosseydyke Wash, during the summer, are great numbers of *Arosettias*, called there *Yelpers*, from their cry. They hover over the sportsman's head like the Lapwing, and fly with their necks and legs extended.

* 'British Zoology,' ii., No. 279.

"Knots are taken in nets along the shores near Fossdyke in great numbers during winter; but they disappear in the spring."*

More follows on the Short-eared Owl and the Cressi heronry, but nothing that is novel, and we need not quote further.

Early in the present century Montagu made a tour through Lincolnshire, with the special object of studying the natural history of the Ruff, and though he says little or nothing of the Fens generally, the account of that species given in his 'Supplement' will always remain a classic passage to the ornithologist, and must be well known to our readers. It is indeed greatly to be regretted that he and Pennant had not more imitators. Numerous collectors no doubt visited one part or another of the Fen country, and some of them were able observers; but, alas! whether ornithologists or entomologists, they have left very scant records of what they saw. These records, however, are well worth hunting up, and since our authors have not been at this trouble, there is an opening for some Fenland faunist here to do good work.

The desire to lay before our readers these overlooked passages, which Messrs. Miller and Skertchly might well have introduced into their work, has led us to such a length that we find ourselves compelled to be very brief in our criticisms of it; but in what we have said, and in what remains for us to say, we strictly limit ourselves to the scope of this present journal, and so we at once dismiss the archæology, the history and antiquities, the geology, the meteorology, and the botany of this bulky volume. All these subjects may be admirably treated for anything we know to the contrary, though the geological teaching laid down has been declared by a contemporary ('Nature,' xviii., p. 514) to be somewhat questionable, if not actually heretical. We cannot even review the entomological portion, and we must confine ourselves to that part which has to do with Vertebrates—the most interesting probably to the readers of 'The Zoologist.' This then

* Gough, in his edition of Camden's 'Britannia,' inserts a condensed version of this interesting description, and the few writers who have ever alluded to it at all have generally credited him with it as the result of his own observation, if they have not laid it to Camden. There can be no doubt that the authorship is due to Pennant, who indeed tells us (*Lit. Life*, p. 37) that to Gough he communicated several of his manuscript journals, and moreover mentions that returning from his third visit to Lincolnshire he passed a day with Gough at Enfield (*ibid.* p. 24). Gough was a respectable topographer and antiquarian, but no naturalist. He, however, showed his good sense by incorporating into his work these remarkable passages.

leaves us only chapters eleven and twelve—the former by Mr. Skertchly, and the latter apparently by Mr. Miller.

Mr. Skertchly's account of the prehistoric fauna of the district seems to us unnecessarily diffuse. Though he says, "it would be going beyond our limits to enlarge upon the fossils preserved to us in the ancient strata which underlie the true fen beds," this is exactly what he has done, or why do we have disquisitions on the fauna of various "gravels" containing remains of Elephant,* Hippopotamus, Rhinoceros and other forms which most assuredly passed away long before the Fens, in the ordinary acceptation of the term, existed? The fauna of the Fenland really begins with what we find in the peat—or the "moor," to use the local name for it. Here he names seventeen mammals, including Man, and a "variety" of *Bos longifrons*! This last is, of course only a domesticated breed of Ox, and we cannot doubt that the Horse also was in like condition, while possibly the same may be said of the Goat and of the normal Long-fronted Ox. This would leave only a dozen species undisputed; but we venture to question the existence when the peat began to form of the Rein-Deer, and think that its remains must be referred to a preceding epoch. The Wolf, the Marten, the Bear, the Beaver, the Boar, all the *Cervidæ* and the *Urus* are now extinct in the district, if not in Britain—and thus the fauna of the early peat days and that of our own would seem to have only two *wild* mammals in common, the Fox and the Otter—but of course a greater number of the smaller British quadrupeds must then have lived, and we know that remains of the Polecat, omitted by Mr. Skertchly, have been found. The authors have done well to introduce a figure of the grand and nearly perfect skeleton of the *Urus* dug up a few years since in Burwell Fen, and now one of the glories of the Cambridge Museum, for it has not been figured before, and is the only specimen approaching to completeness in the kingdom. The same Museum also possesses a nearly perfect skeleton, perhaps unique, of the British Beaver. Mr. Skertchly enumerates but seven species of birds:—the Coot, Bittern, Pelican, Wild and Tame Swan, Teal and Crested Grebe. We can assure him, however, that the traces of several other species, as the Heron and Wild

* At page 335 he goes out of his way to say that three years ago it was reported that a herd of Mammoths had been seen in Siberia, though he does add, "the rumour, however, has never been verified"

Duck, have also been recognized. However, none of these possess much interest except the Pelican, the discovery of which was altogether unexpected. Only two bones of it have been recognized,* and, curiously enough, each of them is a humerus *from the same side of the bird!* M. Alphonse Milne-Edwards has shown that one of them, though of large size, was that of a young bird; hence it may not be unfairly inferred that the species bred in the district. Mr. Skertchly includes the Water Tortoise, but the only remains known to have been found in England were not discovered actually within the limits of the Fens, though in truth not many miles away.

In his account of the modern fauna, the writer, whom we take to be Mr. Miller, hardly rises to his interesting subject. Concerning its earlier condition we have already said enough in quoting and remarking on the extracts above given. In the list of existing mammals (pp. 358—362) we find a few statements that seem to be strange; for instance, Mr. Jenyns's *Plecotus brevimanus* was not "supposed by the author to be a variety of" *P. auritus*, but was described by him as a distinct species, though it is now generally recognized as the young of the Long-eared Bat. In his views as to Shrews, Mr. Miller is strangely at variance with Prof. Bell, for in his last edition we find there but three species given as British, whereas Mr. Miller will have four for the Fens. Nor is the latter happy in his nomenclature, for he calls one of them *Sorex hibernicus!* Had he taken the trouble to refer to Mr. Jenyns's published paper, he would have found this last name to have been given to a supposed variety, from Ireland, of Mr. Jenyns's *S. rusticus*, which is a Fen animal, no doubt, but has been identified in Mr. Bell's last edition (p. 148*a*) with *S. pygmaeus*. In the same work Mr. Bell united *S. remifer* with *S. fodiens*, and there can be little doubt that he was right in so doing; thus Mr. Miller's fourth species of Fen Shrew comes to nothing.†

* Proc. Zool. Soc., 1868, p. 2; 1871, p. 702.

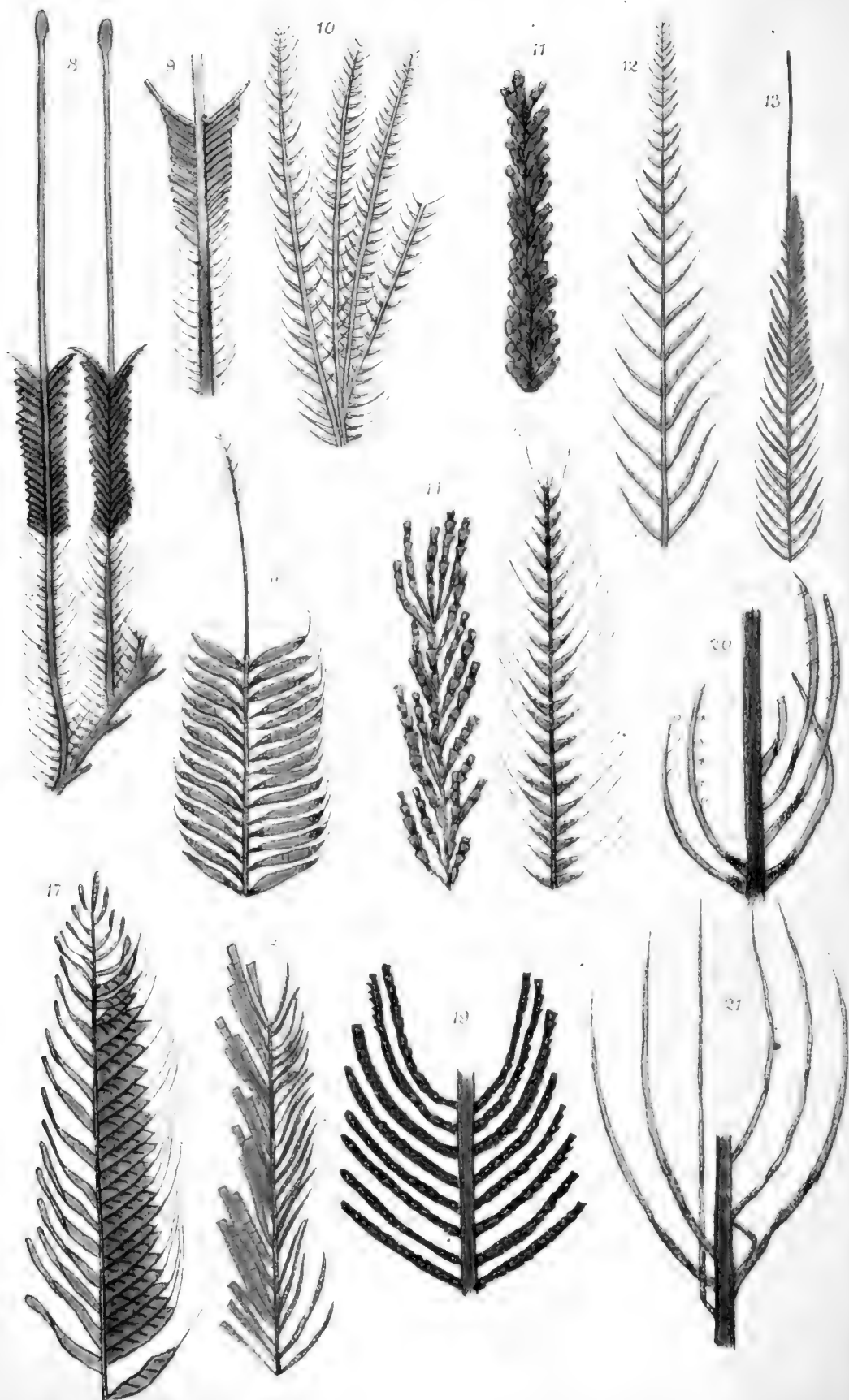
† In mentioning the British Shrews we cannot refrain from expressing our regret that Prof. Bell, or, as we suppose, Mr. Tomes, who assisted him in the *Insectivora*, has given up the old name of *Sorex araneus* for the common Shrew, in favour of *S. vulgaris*. The latter was bestowed by Linnæus in 1754, and he, in 1766,—the date from which all binomial nomenclature in Zoology starts,—replaced it by the far better known *araneus*. No doubt some foreign naturalists have applied this specific designation to a perfectly distinct species, but their misuse does not invalidate the proper use of it by Linnæus.

We also hesitate to believe that the Marten, the Seal, and the Black Rat have any right to be included in the list of existing mammals, to swell which Mr. Miller liberally adds four species of *Arvicola*, one of which is *A. arvalis*, altogether unknown to Britain, while he counts *A. rubidus* and *A. riparia* as distinct.

So far as the Birds are concerned the less said the better. It is true that Mr. Miller has been assisted by some notes by Mr. Cordeaux, which, as would be expected of him, are much to the point; but that gentleman, so far as we are aware, has never made an especial study of the Fen district (in which he does not reside), and naturally would not be supposed to have much to say of its avian peculiarities. Anything more meagre than the rest of the information which Mr. Miller furnishes cannot well be imagined. A three-legged Rook shot in the district and preserved in the Wisbech Museum is honoured by one of his notes. In another the Turtle Dove is pronounced to be only a very occasional visitant—but it is needless to dwell upon remarks of this kind. To the ornithologist they are of no use, to the general reader they are misleading. We had looked in such a work as this for a full and detailed account of the remarkable history of Savi's Warbler,—a bird which was only discovered to be a British denizen just as its last retreat was being destroyed,—but all we find given is its name and a note (furnished by Mr. Cordeaux) containing a quotation that we certainly cannot complain of, but one that never professed to give a history of the species. Of the Fishes the list seems better by far, but here Mr. Miller has had the assistance of Dr. John Lowe, who has before shown himself to be a competent ichthyologist.

It remains for us to say that the present work weighs four pounds six ounces, that it contains, besides the preface, contents, and so forth, 649 pages of excellent paper, and is sumptuously bound. It has a very fair map, several very respectable illustrations—the frontispiece excepted—but a wretched index and more misprints than it has been our bad luck to encounter for a long time.







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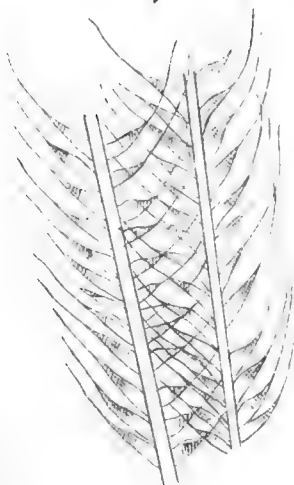
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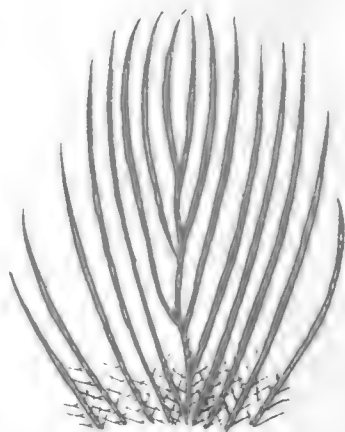
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THIRD SERIES.

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ON THE CHANGE OF COLOUR IN BIRDS, THROUGH AND IRRESPECTIVE OF MOULTING.

*From the Swedish of W. Meves.**

TRANSLATED BY H. E. DRESSER, F.Z.S.

IN a communication to the naturalists assembled at Altenburg on the 6th July, 1862,† Professor H. Schlegel originated a lively discussion on this subject amongst the ornithologists of Germany, during which many different opinions were expressed, and the essays thereon which have since appeared‡ have already attained considerable magnitude. It is, however, really on the theories started by Schlegel respecting “Das Entstehen des voll kommenen Kleides der Vögel durch *Verfärben* und *Wachsen* der Federn unabhängig von der Mauser,” that opinions are divided. I may therefore be permitted to show the result of some researches with which I have been employed for several years, but which must only be looked on as a commencement in a rich field of labour, and which I should scarcely have dared to make known had not another Swede, M. T. Hammargren, lately contributed a paper to the ‘Kongl. Acadamien’ in which the results arrived at do not agree with my own.

Before proceeding to the subject in question, it may be well to give a short review of the chief circumstances attending the moulting of some of our birds.

* Öfv. K. Vet. Ak. Förh., 1854, No. 8.

† ‘Naumannia,’ i., Heft ii., pp. 19—40.

‡ In the ‘Journal für Ornithologie.’

I. *Single and complete Moults in Autumn*.—This takes place in all birds towards the autumn, when both the large wing- and tail-quills, as also the small feathers, are cast and replaced by new ones. Here belong:—

Loxia	Parus
Fringilla	Regulus
Emberiza	Sitta
Alauda	Certhia
Sturnus	Picus
Turdus	Junco
Oriolus	Cuculus
Saxicola œnanthe	Alcedo
Sylvia philomela	Coracias
„ lusciniæ	Upupa
Ruticilla phœnicurus	Columba
„ tithys	Caprimulgus
Erythacus rubecula	Cypselus
Sylvia atricapilla	Strix
„ hortensis	Falco
Phylloscopus trochilus	Tetrao urogallus
„ abietina	Coturnix (?)
„ sibilatrix	Otis
„ hypoleucos	Grus
Acrocephalus arundinaceus	Fulica
Cinclus	Gallinula
Troglodytes	Rallus
Accentor	Scolopax
Hirundo	Numenius
Muscicapa grisola	Recurvirostra
Lanius	Ciconia
Ampelis garrulus	Ardea
Corvus	Cygnus
Pica	Anser
Caryocatactes	Anas tadorna
Garrulus	Dysporus sula, and others.

As exceptions here are the larger birds of prey, which do not change their feathers with any degree of regularity, but generally cast them at longer or shorter intervals.

II. *Double or Spring Moults* takes place towards the spring, and extends when—

- A. *Entire*, to all or most of the small feathers, and in some cases also to the two middle tail- and three inner wing-quills, as, for instance with—

Anthus	Hæmatopus
Motacilla	Charadrius
Saxicola rubetra	Anas glacialis
Sylvia cinerea	Sterna
Muscicapa collaris	Larus
„ atricapilla	Lestris
Tringa	Procellaria
Phalaropus	Colymbus
Totanus	Uria
Limosa	Mormon
Streptilas	Alca

- B. *Partial*, affecting only some of the feathers of the head and neck, as with *Sylvia suecica*, *Emberiza nivalis* and *lapponica*, *Vanellus cristatus*, and also with a large number of the younger males (particularly of Linné's *Passeres*), the first spring after the year of their birth.

III. *Summer Moul.*—Takes place after the pairing season, and is—

- A. *Entire*; in which case all the small feathers are changed, and in some cases (e. g. *Anas boschas*) the four middle tail- and five or six inner wing-quills. The males then adopt a plumage which more or less resembles that of the female; as in the Ducks (excepting *tadorna* and *glacialis*); thus *Anas boschas*, *acuta*, *penelope*, *clypeata*, *querquedula*, *crecca*, *Fuligula cristata*, *ferina*, *clangula*, *mollissima*,* *Mergus*, and others.

- B. *Partial*; in which case the head and neck feathers are exchanged for short, narrow and soft feathers, which almost resemble the immature plumage of the bird; and

* The Eider-drake undergoes, from the middle of June till the commencement of October, an almost uninterrupted change of plumage, at least on the breast; for the reddish breast-feathers are at first succeeded by almost pure brown ones; then similar ones with more or less white in the centre; then reddish ones with a black border; and, lastly, the reddish winter feathers again. Drakes shot in September often show three sorts of these feathers, of which two certainly have blood-quills. No bird therefore affords better opportunities than this for a study of the change of colour by a real moult,

this occurs in *Perdix cinerea*,* *Tetrao bonasia* (in which the summer feathers are generally like down on the points of the new growing autumn feathers), *tetrix* and *urogalloides*.†

IV. *Triple Moults*, or a conjunction of the spring, summer and autumn moults.

- A. *Entire*; including almost all the small feathers, as in *Lagopus alpina* and *subalpina*; although during the summer an almost continuous moult takes place with these birds, three distinct plumages may still be plainly observed, viz. the darker spring, the lighter summer (or, more properly, the autumn dress, as it is not donned until September), and the white winter dress.
- B. *Partial*, embraces the small feathers of the head, neck and under parts. The nuptial dress begins to show itself towards the spring, and is complete about the end of April, and is cast again about the beginning of July. This occurs with *Podiceps auritus*, Linn. (*Podiceps cornutus*, auct.), which becomes, in its summer plumage, *Podiceps arcticus*, auct., and also with *Graculus carbo* and *cristatus*. The former of the two last-named has, in November, on its head quite short blackish-blue feathers, and on its neck grey-brown feathers with a slight blue tinge. From this dress it passes, by change of feathers during the winter, by degrees to the nuptial dress.

Whether the other Grebes assume a particular summer plumage I have not myself had an opportunity of observing, but the subject is worthy of careful investigation.

Besides these changes of plumage caused by the old feathers being entirely cast and fresh ones growing, many birds, especially such as have only a single moult (but also some that moult several times), undergo a very visible change of colour towards the spring; namely, by losing certain portions of their feathers, which operation is here commonly termed "brämfällning," or

* W. von Wright, 'Götheb. K. V. S. Handl. 1850,' p. 78.

+ *Tetrao urogalloides*, therefore, inherits this from its father, the Blackcock, as this summer plumage does not seem to occur so far as the Capercaillie is concerned.

“border-casting.”* This has been observed and explained in various ways.

With the assistance of some sketches I have made, I will now endeavour to answer the chief question—Whether the colouring matter in certain feathers is found there *ab initio*, or is evolved there during the spring or pairing season?

According to the phraseology employed by Nitzsch, a feather consists of the stem (*scapus*), the branches (*rami*), and the plumules (*radii*). From the stem, branches proceed on either side, and from these again plumules; but these last named are not always on the sides, but sometimes on the top of the branches. The small ciliæ and hamuli which are fastened on the radii, and whose province it is to hold these together, are here passed over, as they have nothing to do with the change of colour.†

If we examine the feathers of different birds with the “winter border” under the microscope, we find that behind the white, dark, or colourless outermost points, the colouring matter in some is found in the radii, in others in the rami. Thus there are two forms which may be called, according to their subsequent changes, “plain point casting” and “point and radii casting.”

1. *Point casting* takes place in those birds which have the colouring matter usually in the radii. The colourless or coloured points commence, after the autumn moult, to fall off by degrees; but this casting off is not completed until towards the spring, or much later, and then the hitherto concealed colour shows itself in its full beauty.

PLATE I., fig. 1 shows the upper portion of a black throat-feather, in autumn, with its white points, of a male Redstart, *Ruticilla phœnicurus*: fig. 2, a similar feather in the spring. The points are cast even with the coloured portion. To this group belong *Fringilla montifringilla*, *domestica*, *montana*, *cœlebs*, *chloris*, *spinus*, *Emberizæ*, *Alaudæ*, *Sturnus*, *Turdus* (*T. torquatus*), *Parus*, *Saxicola œnanthe*, *Sylvia tithys*, *suecica* (the reddish brown and black feathers on the breast), many birds that have a partial

* That other causes than this may effect a change in colour in some few Swedish birds, as *Coracias garrula*, *Lanius collurio*, and others might be a subject for enquiry on some future occasion.

† See Prof. Sundevall's work on the wings of birds (Vet. Ak. Handl. 1843).

moult, and particularly young birds, belonging to this group, after their first winter.

2. *Point with radii casting* takes place with such species as have the colouring matter in the rami of their feathers. Here not only the points are cast, but also the colourless radii, with whose points the rami are to some extent covered, and thus their colour appears faint. Naturally the points disappear first, and if we examine such a feather towards the spring we observe at first the plain point casting, and although the colours by that time have become much clearer, we see upon them nevertheless a sort of hoar (*pruina*), which disappears, however, in proportion as the radii-casting extends downwards. The colour does not show itself in its full lustre until the coloured portion of the rami is entirely free from radii.

The feather is now not only much shorter, but also narrower, inasmuch as the radii do not now hinder the rami from approaching each other. Fig. 3 shows a breast-feather in the autumn of the Common Redpoll, *Linota linaria*, male; fig. 4 a centre-piece of a branch from the same feather, much magnified in order to show that the points of the radii overlap the nearest rami; and fig. 5 a breast-feather of the same species in July, when the bird is in full summer plumage.

In some feathers the radii are of very short duration—*e. g.* the red under tail-feathers of the Greater Spotted Woodpecker, *Picus major*. While growing these are covered closely with fine thin radii, so that they look as if strewn] with powder; but the feather has scarcely attained its full length when the radii-casting commences. Fig. 6 represents a portion of such a feather in October. The outer points, which were already free from radii, are not drawn. Similarly the red or yellow feathers on the heads of the Woodpeckers are *ab initio* without these covering radii, and therefore directly on appearing they have their intense colour. Fig. 7 shows such a new feather of the Great Black Woodpecker, *Picus martius*.

To this group belong, further, *Fringilla cannabina*, *erythrina* and *flavirostris*; *Loxia pityopsittacus*, *curvirostra* and *bifasciata*; *Corythus enucleator*; *Sylvia suecica* (the blue feathers); all Woodpeckers with the above-mentioned feathers; *Anas boschas*, *clypeata* and *tadorna*; *Podiceps auritus* (the brown and reddish-brown feathers of the under parts), and some others.

In order to illustrate the very different forms of the radii in various birds, and more especially the very different structure of the feathers in the winter and summer plumage of some birds which undergo a double moult, I give here, in addition, some drawings of the feathers of foreign birds, which I think will sufficiently refute the views of Schlegel and others on the change of feathers without moulting, or the possibility of one form growing out of another.

PLATE II., fig. 8, represents two branches of a breast-feather of the beautiful *Nectarinia senegalensis*, a male, in nuptial plumage. The red tips have *ab initio* no radii, nor are the blue radii lower down cast. These latter differ materially from, for instance, the radii of *Linota linaria* (fig. 4), inasmuch as they are fastened, not on the sides, but on the top of the branches. This may be clearly observed in fig. 9, a branch seen from the under side. The form of the winter plumage probably agrees with fig. 10, which is a portion of a breast-feather of *Nectarinia formosa*, a male, in winter plumage. Fig. 11 is a portion of a similar feather in nuptial plumage, taken from the same specimen in a state of transition to this plumage.

Fig. 12 is a portion of a breast-feather from the middle of the breast of a male *Ploceus rubritorquis* in winter plumage. Fig. 13 is an orange-red branch from the nuptial plumage of the same species, and from the same locality. This bird, as also *Ploceus longicauda*, *axillaris*, *albonotatus*, *capensis*, and others, in addition to all the small feathers, changes the tail-quills twice a year.

Fig. 14 is a portion of a green head-feather from *Anas boschas*, in the spring. After the autumn moult the square-pointed radii are furnished with small colourless points, which, however, soon fall off. The structure of the head-feathers of *Anas clypeata* bear much resemblance to this species, but the colour of the branches is not brownish, but white. Fig. 15 is a branch of a feather from the summer plumage of the same species, and from the same locality.

The radii of the species represented in figs. 8 to 15 undergo naturally, also, a natural abrasion or wearing away; but this does not occasion a brighter tint of colour, being in reality a decay.

In such specimens as are in a state of transition from one stage of plumage to another, we may, if other signs are wanting, easily discover, with the aid of the microscope, which feathers are new, for the old ones always show signs of wear.

Fig. 16 is a green feather-branch from the breast of a male *Trochilus rubineus*. The outer colourless radii, which form the winter plumage, have all nearly fallen off; the point of the branch probably remains until the next moult.

Amongst those birds in which plain point-casting takes place should be included *Cuculus cupreus*. Fig. 17 shows a feather branch from the breast of a male of this species. The radii points turned upon the left side have much to do with the unusual golden lustre of the feather.

Fig. 18 is a branch of the lance-shaped copper-red neck-feathers of the male *Lophophorus impeyanus*. The radii on one side only of the branches are metallic, for those on the other side lie concealed under them. A similar formation is found in the green throat-feathers of *Paradisæa apoda* and in *Epimachus regius* and *magnificus* in their blue-green neck- and head-feathers. On the other hand, the velvety breast-feathers of *E. regius* show on the coloured side a very different formation of the radii. Here the radii may be compared to a row of arrow-heads stuck into each other, and having the barbs standing upwards.

Resemblance in the form of the radii does not show that species possessing similarly formed radii are closely akin, but has probably an important bearing on the feather's lustre, changes, &c.

Fig. 19 is a piece of a blue feather-branch from the breast of *Pavo cristatus*.

Fig. 20 is a piece of a brown feather-branch from the breast of *Anas boschas* in the spring. The radii are cast from the point of the branch, which is not drawn. In the autumn the breast-feathers have besides small white borders. The remaining radii are twisted one turn. This peculiarity I have noticed in many ducks. On the left side are two radii with hooks (*hamuli*), in order to fasten the radii to each other. Such are found to be especially numerous in the water-fowl.

Fig. 21 represents a portion of a reddish-brown breast-feather of *Podiceps auritus*. Here the radii are twisted two turns;

perhaps this assists in some way to keep the water from the body.

In conclusion, it is perhaps scarcely necessary to add that all that has been here stated respecting the details of moult is best shown in old male birds, and very often cannot be relied on so far as the females are concerned.

EXPLANATION OF THE PLATES.

PLATE I.

- | | |
|---|---|
| Fig. 1. <i>Ruticilla phœnicurus</i> , autumn. | Fig. 5. The same, in July; full summer plumage. |
| „ 2. The same, in spring. | „ 6. <i>Picus major</i> , in October. |
| „ 3. <i>Linota linaria</i> , autumn. | „ 7. <i>Picus martius</i> . |
| „ 4. The same, much magnified. | |

PLATE II.

- | | |
|---|--|
| Fig. 8. <i>Nectarinia senegalensis</i> , male, in summer. | Fig. 15. The same, in summer. |
| „ 9. The same, under side. | „ 16. <i>Trochilus rubineus</i> , male. |
| „ 10. <i>Nectarinia formosa</i> , winter. | „ 17. <i>Cuculus cupreus</i> , male. |
| „ 11. The same, nuptial plumage. | „ 18. <i>Lophophorus impeyanus</i> , male. |
| „ 12. <i>Ploceus rubritorquis</i> , winter. | „ 19. <i>Pavo cristatus</i> , male. |
| „ 13. The same, nuptial plumage. | „ 20. <i>Anas boschas</i> , spring. |
| „ 14. <i>Anas boschas</i> , male, in spring. | „ 21. <i>Podiceps auritus</i> . |

NOTES FROM AN ARCTIC JOURNAL.

By H. W. FEILDEN, F.G.S., C.M.Z.S.

(Continued from p. 58.)

In spite of the extremely low temperature which we experienced during the month of March, the rapidly lengthening daylight gave us opportunities of increasing the extent of our walks, and exploring the neighbourhood of our winter-quarters. Every cliff, ravine, water-course, or locality where the snow did not lie was carefully examined. For miles around us the strata were composed of hard limestones, slates, grits and schists, evidently belonging to a remote geological period. The strata were generally vertical, or else dipping at very high angles. To

this series of ancient rocks has been given the name of "Cape-Rawson Beds,"* although they appear to represent in time the Huronian epoch of North America. Though it was somewhat disappointing to find the vicinity of Floeberg Beach composed of metamorphic rocks showing no traces of organic remains, as it deprived us of the possibility of forming an extensive collection of fossils, yet there was much of interest to be observed in the neighbourhood. Recent beds composed of thick deposits of mud, silt, and water-worn gravels were discovered in various localities, and traced to an elevation of nearly a thousand feet. The organic remains found in these beds proved to be identical in every respect with the fauna now existing in Grinnell Land. We discovered in them the bones of the Lemming, Ringed Seal, Reindeer, and Musk-ox, and the shells of the marine Mollusca which are most abundant in the adjacent sea.† This is conclusive evidence that during the lapse of time, indicating an upheaval of Grinnell Land to a height of a thousand feet, there has been little or no change in the existing climate. Not the least interesting discovery was finding drift-wood lying on the surface of the ground, at different elevations up to three hundred or four hundred feet, still retaining its buoyancy, and differing little in appearance from that now being stranded on the shores of the Polar Sea. Whilst granting full effect to the preservative qualities of extreme cold, yet it seemed almost incredible that a substance like wood could remain intact whilst lying on the surface during a period of time requisite to elevate a continent a height of several hundred feet. It was satisfactory, therefore, to observe that, when found inland, this drift-wood was always discovered in situations where it had undoubtedly been uncovered from the glacio-marine beds of the district, by sub-aërial

* 'Quarterly Journal Geological Society,' August, 1878.

† The following species of marine Mollusca have been identified from the Post-tertiary beds of Grinnell Land:—

<i>Pecten grœnlandicus</i>	<i>Neæra subtorta</i>	<i>Buccinum tenue</i>
<i>Leda pernula</i>	<i>Saxicava rugosa</i>	„ <i>hydrophanum</i>
„ <i>frigida</i>	<i>Mya truncata</i>	<i>Trichotropis borealis</i>
„ <i>arctica</i>	<i>Cardium islandicum</i>	<i>Trophon clathratus</i>
<i>Arca glacialis</i>	<i>Tellina calcaria</i>	<i>Pleurotoma tenuicostata</i>
<i>Axinus flexuosus</i>	<i>Thracia obliqua</i>	„ <i>exarata</i>
<i>Astarte borealis</i>	<i>Siphodentalium vitreum</i>	„ <i>Trevelyana</i>
„ <i>fabula</i>	<i>Trochus umbilicalis</i>	<i>Cylichna alba</i>

denudation. The mud-beds in which the drift-wood had been originally imbedded preserved the Mollusca so effectually that, at an elevation of two hundred feet, I found the hinge-ligaments and syphons of *Mya truncata* attached to the shells, pieces of *Laminaria* which emitted the peculiar odour of sea-weed when dug out, and feathers of birds very little decayed.

A series of thirteen samples of this drift-wood was submitted to Dr. R. M'Nab for examination. Eleven proved to be coniferous, and two dicotyledons, both belonging to the same genus *Populus* and to the same species. The eleven coniferous woods represented species of *Abies*, *Larix* or *Picea*, and *Taxus*, the commonest form being some species of *Picea*. Dr. M'Nab was not able to identify the species, but from a careful comparison of specimens is inclined to think them North American, and, as the annual rings are usually very well developed, the trees must have grown in the more temperate northern latitudes. Drift-wood was found by our Arctic explorers of the Franklin Search Expeditions in Melville Island and other parts of the Parry Archipelago, under precisely the same circumstances as we found it in Grinnell Land. Those observers, not being well acquainted with geological effects, came too hastily to the conclusion that the wood had grown *in situ*. This error has been accepted in later days by more than one eminent geologist, and has been adduced as a proof of a mild climate having prevailed within comparatively recent times in the Polar Regions.

Among other interesting observations was the action of the heavy pack-ice when driven on shore by gales, or by the pressure of the ice from seaward. Some of the enormous masses, forty to fifty feet in thickness, were pushed on to the land, driving the gravel and earth before them in the shape of long mounds. On some of these ridges I discovered rounded pebbles, as unmistakably ice-scratched as those which we find in our Scotch and English boulder-clays. From the position in which I found them—namely, on the surface of the sides or slope on which the grounded hummocks had rested—I could not doubt that they had fallen from the bottom of the stranded floebergs when they dissolved in summer. Some of these floebergs had likewise been turned completely over during the turmoil of the elements, and their exposed surfaces were grooved and fluted in an analogous manner to that which we observe with rocks in glaciated districts.

Partially imbedded in these floebergs were fragments of rock or pebbles, with mud undoubtedly derived from contact with the sea-bottom; not unfrequently these pebbles were ice-scratched. It would be difficult to imagine how these scratchings could be produced, crossing one another over the surface of the same pebble, if we had to rely on only one form of movement of the floeberg when in contact with the bottom—namely, a direct on-shore pressure. A phenomenon which I frequently observed may, however, easily account for these ice-scratchings. At the periods of high-tides, as the tidal wave flowed in with extra force, the whole body of the young or season's ice, approaching six feet in thickness, was affected; it rose and fell under one's feet with peculiar throbs or pulsations. This sheet of young ice, by which the large hummocks were surrounded, unquestionably acted as a raft, raising the huge masses from the ground, and then as the tidal flow receded, permitting them again to grind against the bottom. A convincing proof of this up and down movement of the ice-raft was given in the case of the largest floebergs, which being too deeply imbedded in the bottom refused to move. Around them the season's ice could not resist the pressure of the tidal in-flow, but split with a loud report, the water rising from below through these cracks, and flooding the ice which adhered to these immovable masses.

On the 11th March the quartermaster on watch observed three white birds fly past the ship in a northerly direction, and two or three days afterwards the tracks of Ptarmigan were observed in the snow, near to spots where the snow covering had been removed by the force of the wind. On the 16th I found a Ptarmigan's feather close to a plant of *Potentilla*, which the bird had been scratching at. This early appearance of these birds in Grinnell Land during the coldest month of the Arctic year seems remarkable, and raises the question in my mind whether some of them do not winter by choice in those inhospitable regions, within four hundred and fifty miles of the North Pole. I do not think that it can be doubted that *Lagopus hemileucurus* is a permanent resident in Spitsbergen, and the same may hold good with *L. rupestris* in Grinnell Land. If so, the genus *Lagopus* contains the only species of birds that can exist throughout the year in the Polar zone.

The entries in my journal for the month of March consist

almost entirely of accounts of walks taken in the neighbourhood of Floeberg Beach, and references to the geological structure of the district. On the 23rd, in company with Captain Nares and Lieutenant May, I ascended a hill some five miles inland, which rises to a height of 1400 feet above the sea. Where uncovered, the sides of this hill showed slopes of broken slates, looking like the *débris* thrown out from a slate quarry. Mixed with the fragments of slate were numerous pieces of yellow quartz, prettily crystallized, which had originally run in veins through the slate-rock. From an elevation of 800 feet lichen-growth became more plentiful, and luxuriant; several of the larger species, which were not to be found at the sea-level, covered all the exposed stones and rocks. This observation on the increase of lichen-growth at considerable altitudes in Grinnell Land was corroborated by me in the future; and it is deserving of notice, that an elevation of 1200 to 1400 feet in Grinnell Land seems to be most conducive to the growth of these plants. The lower ranges of hills and headlands, which were chiefly accessible to us in Grinnell Land, rose as a rule to the altitudes above mentioned, and were of course greatly exposed to the violent winds. In consequence, those areas are more frequently bared of snow throughout the year, even in winter, than the lower levels, where the snow drifts and only disappears for a short time in summer under the influence of the sun's rays. Again, on the higher mountains of 5000 feet altitude (none of which I ascended) the region of perpetual snow appeared to have been reached, and probably there would be a less area available for the dispersion of lichens. In other words, we found the maximum of lichen-growth at the altitudes where the snow lay with least persistency.

On the extreme summit of the hill which we ascended on the 23rd, and which was named "The Dean," I found the characteristic erratic boulders of the lower land, in the shape of rounded blocks of gneiss and dark chocolate coloured conglomerates—indeed, these proofs of submergence were found by me at the highest altitudes I reached in Grinnell Land.

On the 29th March a Snowy Owl was seen by Lieut. Parr lazily flapping over the lowlands near the sea shore, a lapse of five months having intervened between the latest appearance of this species in autumn and its return in the ensuing year.

On the 1st April the fresh tracks of a small party of Musk-oxen were discovered in the vicinity of winter-quarters. Though our most eager sportsmen went in pursuit, no one was successful in meeting with them. The tracks of the animals showed that they had been moving from the north-west, probably from some of the sheltered valleys about Cape Joseph Henry. A pack of Wolves had followed these Musk-oxen, and from traces that I examined it was evident that they had been able to secure at least one of them, the droppings of the Wolves being largely composed of the wool and hair of the Musk-ox. The most extraordinary circumstance in connection with the life-history of the Musk-ox is its capability of finding subsistence in Grinnell Land during the long Arctic night. We may dismiss from our consideration the question of a southern migration, for there is no land within the possibility of reach of these animals where the winter conditions would be appreciably modified, whilst we know for certain that the Musk-oxen living in the extreme north of Greenland never pass to the south of the great Humboldt Glacier. The extraordinary powers that these animals must possess of resisting cold does not excite my astonishment so much as their capability of procuring food during the long night. Even in those months during which the sun remains above the horizon for the whole twenty-four hours, it is a matter of wonder how such large animals can obtain not only subsistence, but accumulate large quantities of fat; but during the five months that the sun remains below the horizon, and every scrap of food must be searched for beneath a deep snow covering, the difficulty of existence must be greatly increased. No animal represents more fully than the Musk-ox the truth of the doctrine of the "survival of the fittest." The oldest, perhaps, of existing mammals, it has found for itself in the Arctic and Polar Regions an almost impregnable retreat from the assaults of man, so destructive to the large Mammalia in all other portions of the globe. Unaffected by the rigours of the Arctic winter, and finding subsistence on the sparse vegetation of those utterly dreary regions, the species will doubtless survive long after the Elephant, Bison, and many other large quadrupeds of tropical and temperate regions have passed away.

On the 3rd April our main sledging parties left the ship for their long, toilsome, and perilous journeys. It was an affecting

parting, for all knew the dangers and risks that must be encountered by the travellers, and felt how unlikely it was that we all should meet again. After the departure of the sledge parties, we remained thirteen souls on board the ship, including the sick. On the 17th April I first noticed drops of water trickling down the face of a dark rock exposed to the full force of the sun's rays. On the 24th, I left the ship in company with Lieut. May, taking the dog-sledge and seven dogs. Our instructions were to proceed to the southwards as far as Lincoln Bay, and endeavour to find a practicable land route in rear of the various headlands which descend abruptly to the sea between that point and winter-quarters. This survey was very necessary, as in the event of the ice in Robeson Channel breaking up and entirely detaching from the shore, a land line of communication with the 'Discovery' was imperative. The temperature at starting was -20° , sufficiently low to give us an adequate idea of the misery inseparable from Arctic-sledging. Whilst labouring at the sledge, exerting oneself to the extreme limit of human endurance, no matter how low the temperature, the perspiration pours from one's body, and all underclothing becomes soaked. Whenever a halt occurs this condition of affairs becomes reversed, and the wet under-garments become frozen. Such sudden changes are very painful to bear. Our little party returned to the ship on the last day of the month, having satisfactorily carried out the object of its despatch by finding a practicable land path to Lincoln Bay. Though this short trip enabled me to add very considerably to our acquaintance with the geological features of the country, so far as notice of animal-life was concerned it proved nearly blank. A single Hare, which we shot and brought back to the ship for the sick, with a few Lemmings, were the only living things that we encountered.

On the 11th May I again left the ship with the dog-sledge and a party under the command of Lieut. Egerton, for the purpose of surveying the United States Range of mountains lying to the north-west of our winter-quarters.

I know of no record of travel so monotonous as an Arctic sledging journal; and though I have endeavoured to compress my experiences as far as possible, yet I feel that I owe an apology to the readers of 'The Zoologist' for the length to which these notes have already extended. Day after day the same

difficulties are encountered and overcome by an enormous expenditure of energy. Rugged ice is met with that will only yield a passage to the sledge by the use of the pickaxe; soft snow, into which the sledge sinks and requires the utmost exertion of men and dogs to extricate it; places are come across where dogs and sledge have to be lowered by ropes and hauled up again; add to these difficulties, low temperature, frost-bitten fingers, snow-blindness, and generally great thirst, with no possibility of relieving it. When the camping place is reached men and dogs are thoroughly fatigued, and it requires all the remaining energy of the party to pitch the tent, feed the dogs, and prepare some food before crawling into the sleeping bags. During the march it is almost impossible to leave the party, as, if the travelling is bad, an undue share of labour is thrown upon one's comrades; whilst, on the other hand, if the travelling be exceptionally good, the man who stays behind to collect specimens or wanders from the track, runs the chance of being lost, and, in any case, has a large amount of "leeway" to make up. I refer to these facts for the consideration of others who may be tempted, in the future, to undertake a similar journey to this region in the interests of Natural History. Let such a one remember that the difficulties attending research in the far north are equal to, if they do not exceed, those which the traveller in any other part of the globe can encounter, and consequently his expectation of results must not be too sanguine.

On the 13th we reached Dépôt Point; the temperature, at $+15^{\circ}$ when commencing the march, felt very warm. The dogs seemed to feel the heat greatly; whenever we halted they threw themselves on their backs, and rolled in the snow. A wind springing up, the temperature fell to -5° . We camped under the cliffs of Dépôt Point. A Snow Bunting, flying from rock to rock, cheered us with his sweet song. It was the first of the species we had met with that spring. The edges of the hummocks exposed to the sun's rays were dripping, and icicles six feet in length were hanging from their sides. We had observed during the march the tracks of a Wolf, and those of Lemmings on the floe, several miles from land. The 14th was spent in ascending a hill some 1500 feet in altitude, about four miles to the westward of camp. From the summit we had a fine view, and fixed on a promising-looking valley to the north-

wards, which debouched upon the coast in about lat. $82^{\circ} 40' N.$, as most likely to give us access to the United States Mountains. We saw that day a pair of Ptarmigan, *Lagopus rupestris*; they were very tame. I shot the male first, and the female did not move from the side of the dead bird.

On the 15th, after a very arduous day's work across a broad inlet, where the ice consisted of rugged blue-coloured floes of ancient ice, we gained the broad valley leading to the westward, which we had observed from our look-out station of the day before. About half a mile from the shore we disturbed a Snowy Owl from the ground; it flew across our path and alighted on a hill-side. I and Frederic, the Greenlander, left the sledge and went in pursuit, but, after several weary miles' walk, had to give up the chase. The wary bird always rose when we got within a distance of eighty or a hundred yards.

The 16th turned out very foggy, and as we advanced inland the snow became so soft and deep that the united exertions of men and dogs only enabled us to advance the sledge a few hundred yards in an hour. Finding further progress to the westward with our laden sledge impossible, owing to the softness and depth of the snow, we determined to go into camp; and the next day Egerton, Frederic and I started with the empty dog-sledge and one hundred feet of line, with a view of ascending a noble mountain, which we christened on the spot "The Great Pyramid," but which afterwards received the name of Mount Grant. We were in hopes of ascending this fine peak, which rose from the northern slope of the valley, at a distance of some ten miles from camp, by taking advantage of the rising terraces on the northern face of the valley, and attaining a point on which the magnificent snow slope of "The Great Pyramid" seemed to abut. After five hours hard travelling we reached this point at an elevation of some nine hundred feet above the sea, meeting on our way with many tracks of Musk-oxen, a good deal of withered grass in spots, two Ptarmigan, and a single Snow Bunting; also the tracks of Fox, Hare, and Lemming. The rocks, where exposed, consisted of coarse quartzose-grit. Leaving Frederic and the dogs at this spot, Egerton and I climbed the shoulder of the hill and ascended to its summit, an elevation of 1825 feet by aneroid. From there we had a good view, as we looked to the northward across James Ross Bay

over the frozen Polar Ocean, whilst directly below us was a tremendous ravine, which, cutting through the ridge on which we were standing, effectually cut us off from the slope of "The Great Pyramid," the height of which we estimated at 5000 feet. Failing in the main object of our day's enterprise, we then attempted to travel to the westward, but the softness of the snow prevented our proceeding over four or five miles; the dogs sank up to their backs, and advanced by a series of bounds; we could only get along by hanging on to the back of the sledge. We returned to camp after thirteen hours' continuous hard work, completely worn out.

We remained in this valley during the 18th, 19th, and 20th, making excursions in various directions. We procured a few Hares and two or three couples of Ptarmigan, and saw a few Snow Buntings, which were mating by this date. Having fixed the position, and taken the altitude of several heights in the neighbourhood of the valley where we had encamped, we shifted our quarters and moved to the southwards. On leaving the ship we were provisioned for fourteen days, the full extent to which our sledge could transport food for ourselves and dogs. Consequently, on the 24th May our party returned to the 'Alert.'

On arriving there we found Captain Nares and Lieut. May prepared to start on the following day, with a dog-sledge, for Cape Joseph Henry and the northward, it being the Captain's intention to investigate personally the condition of the ice on the northern shores of Grinnell Land. An invitation to join this party was gladly accepted by me, and after a good meal, a change of clothes, and a refreshing sleep in a warm bed, I started again from the ship on the 25th. On the 26th we left our camp at 7 p.m.; the weather misty, and blowing strong from the north, our leader walking in advance, found considerable difficulty in steering a course over the floe,—however, we struck the shore-ice about a mile south of Dépôt Point, the position we were aiming for. A Wolf followed us all through that march, so Mr. May and I dropped behind the sledge and hid ourselves under a hummock in hopes of outwitting this animal, but he suspected us and did not give a fair shot. I noticed that the gait of this Wolf was more slinking than that of our Eskimo dogs; it carried its tail in a drooping manner. This beast appeared to be about half as big again as our largest dog. The

27th and 28th may be dismissed with the remark that they were two days of uncommon hard work for both the men and dogs of our party.

The 29th saw us encamped near Cape Joseph Henry. This was a beautiful day, and Captain Nares determined to take advantage of the clearness of the atmosphere, by ascending Mount Julia, a hill in the neighbourhood. Accompanied by one of the men, and carrying a theodolite between us, we left camp at five o'clock in the evening. After a stiff climb of six hours' duration we reached the top of the hill, an altitude of 2000 feet. From that point we obtained a magnificent view. Though mist and cloud hung over the valleys immediately beneath us, yet in every other direction our range of vision was unobstructed. To the northwards over the Polar Ocean we could see at least fifty miles; and a careful examination through the telescope showed that within that range, not a pool of water—not even a water cloud—was discernible to break the dreary monotony of piled-up ice. No land, or any trace of land, was perceptible. Our hearts sunk within us when we gazed upon this scene of appalling desolation, for we felt at once how futile must have been the attempts of Markham and his brave companions to make a long journey in the direction of the Pole over such an area as there lay beneath us. After taking a series of angles, which was bitterly cold work, and building a cairn, we commenced our descent of the hill. Mount Julia is composed of a hard blue-coloured carboniferous limestone, containing a considerable assemblage of fossil remains. After returning to camp and getting a meal—time being too precious to expend in sleep—I started with one of our men along the shore to the northward. We saw a pair of Ptarmigan, the female of which we shot. This bird was in full summer plumage, and may be recorded as the most northern ornithological specimen ever secured, having been killed in lat. $82^{\circ} 46' N$. We returned to the tent on the afternoon of the 30th, the wind having commenced to blow from the northward very cold, with sleet and snow. Throughout the whole of that night Captain Nares and I, and two of the men, laboured in the ravines collecting fossils, and by the morning of the 31st a goodly pile was stacked in front of the tent. From a spell of work of over thirty-six hours' duration, we were glad to turn into our bags. After four hours'

rest, Captain Nares and I again visited the fossiliferous strata, and added to our collection. It would be merely recapitulation to recite the incidents of each day separately; suffice it to say that we gave ourselves barely sufficient time for meals, and hardly any to sleep.

On the 1st June we moved camp a little further northwards, but found our travelling much impeded by the weight on the sledge. The 2nd June turned out a wretched day, with snow and mist, and we failed in an attempt to reach the actual promontory of Cape Joseph Henry. By the evening of the 3rd we had to start on our return journey to the ship. Shortly after leaving this our most northern camp, we came upon an almost entire skeleton of a Musk-ox. Heavily laden as our sledge was with fossils, I could not help transferring the skull* of this animal to it. As it was, we were very often obliged to unpack the sledge and proceed with half loads, going back for the residue. From the large collection of carboniferous fossils that we made near Cape Joseph Henry, we were only able to take away a selection; and a very large collection, ready for transportation, is now lying on the coast of Grinnell Land, in lat. $82^{\circ} 45' N$.

Up to the date of the 5th June, I had only observed the following species of birds since the return of daylight, namely, Snowy Owl, Snow Bunting, and Ptarmigan. We had just got into our bags on that day, when the cook called out that there was a Ptarmigan close to the tent, so I crawled outside and shot it. Whilst returning to the tent I heard the cry of some waders, and, looking in the direction it came from, saw a flock of fourteen Knots, *Tringa canutus*, circling over a small bare patch near the summit of a hill, where they alighted and commenced picking. To get near them was very difficult, the sun's heat had turned the hill slope into ice. Over and over again I fell down, sometimes sliding back several paces, at another time breaking through the ice-crust and sinking above the knees in the sodden snow. As often happens under analogous circumstances, just as I was getting within range the Knots gave a merry whistle and made off. By this time I was dripping, with tumbling about in the wet snow, but seeing three Hares feeding further up the valley, went in pursuit of them; my efforts, however, were not successful. Before reaching camp a pair of

* This specimen is now in the collection of Mr. E. R. Alston.

Knots rose in front of me, both of which I killed. They were male and female, in rich breeding plumage; their stomachs were full of the buds of *Saxifraga oppositifolia*, the plant around which I had seen them circling. Later on in the day I observed other parties of Knots, and with them a few Turnstones and Sanderlings.

On the 6th, as we journeyed along, a Buffon's Skua, evidently hunting for Lemmings, passed near enough to the sledge to be recognizable. That day a single open blossom of *Saxifraga oppositifolia* was found; it is needless to remark how much it gladdened our eyes. The transient summer of the Polar zone was near at hand. As we passed along through the softening snow, Knots and Turnstones were to be heard calling around us, and insect life, in the shape of flies and midges, was once again awakened. A Seal, *Phoca hispida*, was seen lying on the ice of Dumbell Bay as we passed by. On the evening of the 7th June, the party with which I had been travelling returned to the ship.

On the following day Lieut. Parr arrived with the news of the utter prostration of Markham's party from scurvy. They had been fortunate enough to reach the land and get some supplies at the depôt near Cape Joseph Henry, and were then toiling slowly and sadly homeward. In less than three hours after Parr's arrival, the dog-sledge with Dr. Moss and Mr. May had started to the succour of Markham's party: an hour later a couple of sledges, with Captain Nares and every available officer and man in the drag ropes, proceeded on the same service. Early in the morning of the 14th Markham and his party were safe on board the vessel. On the 9th four Brent Geese were shot, and on the 12th several pairs were flying along the coast-line, apparently in search of bare places to alight on where a sprinkling of vegetation was to be found. Such spots were still few and far between.* On the 16th I observed three Arctic Terns, *Sterna macrura*, in the neighbourhood of winter-quarters.

The insurmountable obstacles encountered by Markham during his journey over the Polar ice, having fully demonstrated

* No flocks of Brent Geese, or indeed a single individual of this species, or any of the *Anatidæ*, were seen winging their way due north over the Frozen Sea, which would have been the case did migration extend in that direction. In every instance they clung to the coast-line.

the futility of a renewal of the enterprise in the following year, Captain Nares announced his intention to abandon all further exploration in a northerly direction, and to proceed southwards, if possible, during the navigable season of 1876. Permission having been granted us to make use of what remained in the depôts of supplies that had been laid out for the exploring parties, Parr and I left the ship on the 19th June, dragging with us a small satellite sledge, which transported our guns and ammunition, and a change of clothing. The floe, though covered with pools of water, still afforded tolerable travelling, though every hour the thaw was advancing with astonishing rapidity. During our first march from the ship we saw three Arctic Terns, and flushed a Dovekie from a pool, which however got away. At Mushroom Point a pair of Buffon's Skuas were seated on a bare ridge of gravel; one of these we shot whilst it was busily employed feeding on a Lemming. We arrived at Dumbell Bay early on the 20th, where we shot one of a pair of Brent Geese, and a single Ptarmigan and Sanderling; we searched diligently for the nests of these birds, which we believed to be breeding in the vicinity, but without success. This was the total amount of bird-life that we met with in that locality. The morning of the 21st found us at Knot Harbour, the spot where we first met with *Tringa canutus* on the 5th June. A tent having been left there for the convenience of the travelling parties, we determined to make this spot our head-quarters, as the country around was tolerably bare of snow, and several valleys leading from the sea-coast offered shelter and a chance of subsistence to birds and animals.

The number of each species of bird that visits the northern shore of Grinnell Land is extremely limited; we only found some five pairs of Brent Geese nesting within a radius of several miles of Knot Harbour. Knots were rather more abundant; their cry reminded me somewhat of the Curlew, *Numenius arquata*. The nearest approach that I can make to describing the note, are the words "Tullawee Tullawee whee whee," repeated over and over again: the last two notes are much prolonged, and sound very mournfully. When these birds were mating I frequently saw a female pursued in the air by a couple of males at the same time. The Knot has not the power of drumming like the Common Snipe, but, after soaring in mid-air with outspread

pinions, they frequently descended to the ground. During this descent the wings were beaten over the back with such rapid motion that a loud whirring noise was produced, which might be heard at some distance. According to my observations, this action was confined to the males and to the period of courtship.

Two magnificent Snowy Owls, evidently breeding, haunted a valley some two miles from the tent; they were very wary birds, never alighting where it was possible to approach them under cover. On one occasion, after disturbing these Owls, they flew over a spot where a Brent Goose was sitting. The goose rose from her nest and made directly at the Owl, following it, and driving it off for some distance. This action on the part of the Goose disclosed her nest, which we found to be a comfortable structure of down, placed on a base of Saxifrage stems, grass, and moss, and containing four eggs. The gander was close by, and ran hissing at me when I interfered with the nest. I felt very sorry to kill these poor birds, but I had scurvy-stricken men on board ship, whose recovery depended upon a supply of fresh meat. On the 22nd I noticed a pair of Turnstones feeding; from their actions I felt confident that they had a nest not far off, but, after watching them for more than an hour, the cold wind forced me to move on. I was greatly interested by seeing these birds actually turn over and reverse pieces of slate, three inches in diameter, and pick up the spiders and *Acaridea* that were to be found underneath them. The bird put its bill fairly under the centre of the slate, and then pitched it over with a good toss of the head. I saw it perform this action within twenty paces of where I was lying, and ran forward and picked up the piece of slate, the damp under-surface being exposed as it lay on the dry shingle. This relic I brought home with me, and still retain.

On the 23rd we found a nest of Buffon's Skua, *Stercorarius parasiticus*; the two eggs were laid in a depression on a gravel flat; they were of a delicate green ground colour, and, except in being somewhat smaller, hardly differ from those of Richardson's Skua, *S. crepidatus*. The old birds were very bold, and tried to drive us from the vicinity of the nest by darting at our heads.

All through the 24th it blew a strong warm gale from the S.S.W., which worked a rapid change both on the floe and on the shore; the former was now covered with pools of water, and down the land-slopes rivulets were pouring in every direction.

The condition of affairs warned us to be off, but another day's search after the nest of *Tringa canutus* was decided on.

On leaving the tent, Parr and I separated. The strong breeze seemed to have driven the birds to seek shelter; for several hours I wandered without seeing a living creature. Towards evening I observed a Glaucous Gull hovering over a fresh-water pool some distance inland, and passed a Buffon's Skua feeding on a Lemming; it allowed me to walk within twenty paces of it, and then backed away from me, at the same time making violent attempts to swallow the Lemming, in which it at last succeeded. Whilst walking along some old gravel beaches, at a height of some 800 feet above the sea, I saw a Sanderling running like a mouse amongst the stones. Throwing myself flat on the ground, I watched the bird circling round and round, until at last it returned to near the very spot where I had first observed it moving. The nesting place was a depression in the centre of a plant of *Salix arctica*, and was lined with a few dried leaves and catkins of the plant; the eggs, two in number, may be compared to miniature Curlew's, but the ground colour is not so green.* The sitting bird proved on dissection to be the male.

Late in the evening, whilst returning to camp, I met Parr carrying three Brent Geese, who informed me that he had found the nest of the Snowy Owls in Hare Ravine; but knowing that I should like to see the eggs *in situ*, he had refrained from touching them. It was about 9 P.M. when we retraced our steps to the Owl's nest, which was placed on the summit of a small hill in the bottom of the valley; the eggs, seven in number, lay on the bare ground in a small depression which had evidently been scraped out by the birds. Hiding behind a rock, I waited the return of the birds; in about half an hour the larger of the pair came hovering over the eggs, and fell to my gun. I drew back on the chance of the cock bird coming within range. In a short time he came hovering over, crying "Whew, whew." Imagine my mortification when the bird I thought dead rose to its feet, got the wind under its wings, and sailed away across the valley, accompanied by its mate. I started in pursuit, but a "stern-chase" through heavy snow is a long one; and though I followed the bird for miles, and often got within a hundred yards,

* These eggs are figured in the Appendix to Sir George Nares' 'Voyage to the Polar Sea,' vol. ii., p. 210.

yet in the end it escaped; it was three o'clock in the morning of the same day before we got back to camp.*

Whilst waiting at the Snowy Owl's nest we found a Snow Bunting's, containing three eggs; it was a well-made structure of grass, lined with the feathers of *Nyctea scandiaca*. Blowing eggs, skinning birds, and packing up our sledge, occupied us till mid-day, when we started for the ship, as every hour the rapidity of the thaw was increasing the risk of travelling over the floes. It may have been observed in this short account of my sledging experiences, that not unfrequently we were obliged to carry on without lying down to rest through twenty-four, thirty-six, and in some cases over forty hours of work. This, I think, would be hardly possible in regions where there is night and day in the twenty-four hours, but during the long continuous day of the Polar summer the human system seems capable of bearing up against the want of sleep in a truly remarkable manner.

Leaving our camp we dragged our sledge on to the shore-ice, which extended for about a mile to seaward; and though it was covered at this season of the year with a layer of icy-cold water, which reached to our knees, yet beyond the discomfort of wading through water at 32° F. the travelling was tolerable and the sledge pulled easily; but when we reached the old floe, and from there to Simmond's Island, the travelling was truly execrable. In the sodden snow which lay between the ice-hillocks and ridges of the ancient floes we often sunk up to our hips, and slush and ice-cold water reached above our knees. Over and over again, as we tugged at the deeply-imbedded sledge, it moved suddenly forward, throwing us on our faces, and we found no little difficulty in regaining an upright position. However, we reached Simmond's Island by 6 P.M., took our guns and walked round it. We saw four pairs of Brent Geese on it, and found three nests; one contained five eggs, the others four. The nests, as usual, were solid structures of grass and moss, the eggs being buried in a mass of down from the breast of the parent bird. We shot five out of the eight geese breeding on this island. By 8 P.M. we were back to the sledge, lashed on the dead geese, and were again in the drag-ropes. The journey from the island to the mainland was equally arduous as that we had encountered in the

* The eggs from this nest of *Nyctea scandiaca*—seven in number—passed safely through the ordeal of the sledge journey, and are now in the British Museum.

first part of our march, and our sufferings were aggravated by its blowing half a gale of wind in our faces. We reached the camping-place on the mainland at 12 P.M. nearly exhausted, and so benumbed by cold that it was as much as we could do to prepare our supper.

After a good sleep in the tent at Dumbell Bay, we started at mid-day of the 26th. The travelling to Mushroom Point was particularly bad; often times we sank to our waists, through a foot of water and then sludge. The satellite sledge got buried, and we had to face about and extricate it by "standing-hauls." We reached Mushroom Point in the evening: from there to the ship we saw a single Glaucous Gull, several Buffon's Skuas, several pairs of Arctic Terns, a flock of fifteen King Eiders, one of which we obtained; and a single Fulmar Petrel passed us at about seventy yards distance. During this march we encountered real rain, for the first time that year. The ship was reached early in the morning of the 27th June.

During July, and particularly in the first half of the month, the explorer of Polar lands has to contend against an enemy more potent even than the cold in contracting his walks—I refer to the thaw. Every valley and ravine was occupied by a stream; many of these became rapid foaming torrents that it was extremely difficult to cross without the aid of bridge or boat; the flats were converted into lakes, snow-drifts into treacherous sloughs impossible to wade through. To seaward the pack was equally difficult to cross, and even dangerous to venture on. Thus it will be seen that our area for walking over was practically very restricted. A few Phalaropes, *P. fulicarius*, were observed, and one or two examples secured, though I did not discover the nest. The bill of this species when in full breeding-plumage is bright orange, tipped with dark hair-brown. The female is larger and brighter coloured than the male.

I noted on the 1st July that the Knots were still courting; the males were chasing the females, and uttering their shrill melancholy note. The melting of the snow placed the Lemmings at great disadvantage with their enemies, the Skuas. No longer were they able to dive with rapidity into a snow-drift or take refuge in their numerous galleries; the sole place of retreat was under stones. When overtaken in the open the little creatures showed fight; they are extremely tender, the slightest

tap killing them at once. Buffon's Skua hovers over its prey very much like the Kestrel, *F. tinnunculus*, with rapidly beating wings and expanded tail.

On July 5th Mr. Parr fell in with three Musk-oxen about two miles and a half from the ship; he managed to secure all three of them—a young bull and two cows. These animals were thin and in poor condition. On the morning of the 6th a fair-sized bull was seen on the shore, not far from the ship. Several of us ran out to shoot it, but Dr. Moss was the fortunate one who secured it. This animal having been killed in close proximity to the ship, Captain Nares gave me permission to take the hide and skeleton, provided that I saved the meat for the use of the ship's company.* The weight of the meat that I sent on board from the carcase amounted to 211 lbs.; the heart, liver, and kidneys to 12 lbs. more.

Night after night I passed out on the hills trying to find the nest of the Knot. Not a day passed without my seeing them feeding in small flocks; but they were very wild, rising with shrill cries when one approached within a quarter of a mile of the mud-flats on which they were feeding. It is very extraordinary, considering the hundreds of miles traversed by myself and my companions,—all of us on the look-out for this bird's eggs, and several of us experienced bird's-nesters,—that we found no trace of its breeding until the young in down were discovered.

I found two or three species of *Collembola* very common in the neighbourhood of Floeberg Beach; one especially, probably *Podura hyperborea*, was to be seen in myriads on the surface of the snow, and also floating on the surface of the little rills that were fed by the dribbling from the snow. I made several attempts to dredge through cracks in the outside pack, but all proved nearly or quite unsuccessful. There was not sufficient length of fissure in any place I could reach to give the dredge a fair sweep, or to allow the lip to scrape the bottom. We had, therefore, to content ourselves with the specimens captured in baited traps let down the fire-hole.

On the 11th July, the water in the ravines and torrent-courses having considerably decreased, I again left the ship in company with my indefatigable messmate, Mr. Parr. Our idea was to proceed to the tent at Dumbell Bay, make use of the residue of

* This animal is now in the British Museum.

the provisions left there, and thoroughly explore the neighbourhood of that locality, Captain Nares having granted us permission to be absent from the ship for one week. On this occasion we took no sledge, as travelling over the floes was not to be depended on, but carried our ammunition—a change of under clothing and collecting gear—on our backs, the equipment amounting to 28 lbs. in weight for each of us.

The stream in the first ravine north of winter-quarters was still running strong; we selected the widest and shallowest place for crossing, but though only half way up our thighs it was quite as much as we could do to retain our foothold. The water was bitterly cold, and we were nearly benumbed on reaching the opposite bank; after wringing out our wet garments, we proceeded. In the bottom of the next ravine we descried two Brent Geese and a flock of twenty-eight Knots feeding, but they were very wild, and rose long before we got within shot. The temperature was tolerable and the travelling excellent, as we kept along the gravel ridges parallel to the shore, which marked the lines of upheaval of old sea-beaches. The next broad stream reached we flanked by going out on the floe; and, as it was low-tide, the water nowhere lay deeper than a foot. Near Mushroom Point we came upon a pair of Buffon's Skuas breeding, and took their two eggs. The audacity of this bird is surprising; when near the nest they attacked us with the greatest vigour, darting at our heads; and not until I had struck the hen bird a rap with my gun-barrel did she cease from her assaults.

The scanty flora, at that time bursting into bloom, excited our interest and attention. Accustomed as we are in England never to be without the sight of vegetation throughout the year, it is difficult to realize, until it becomes a fact, the enormous deprivation involved in the entire absence of leaf, flower or shrub, for ten months out of the twelve. I can hardly describe the pleasure we felt in seeing the delicate green leaves of the willow, the yellow blossoms of the poppy, the diminutive flowers of the *Drabas*, and, above all, those of the most wide-spread and abundant of Arctic plants, the purple saxifrage. That lovely flower, then at the very height of its bloom, coloured purple some of the brows and banks which we traversed.

(To be continued.)

ORNITHOLOGICAL NOTES FROM WEST SUSSEX.

BY WILLIAM JEFFERY.

I HAD intended recording the occurrence of two Night Herons in full plumage, shot at Earnley, near Chichester—a male on April 28th, and a female on May 1st, 1876. I saw both specimens in the birdstuffer's hands. Since then I have seen (December 17th, 1877) a specimen of the Little Owl, said to have been shot at Earnley; and a second was reported, captured alive at the same place—all four birds by the same gentleman. This second Little Owl I obtained possession of on 21st May last, and kept it alive until November 24th, when it died. I now record these four occurrences with much reserve, having lately heard that the Little Owls were obtained in the London market,* rendering also the facts relating to the Night Herons doubtful, though the birdstuffer maintains that all are genuine.

On November 1st, 1876, Mr. Willet, of Brighton, informed me that a Glossy Ibis had been shot near Arundel about a month previously, and had come into his possession. About this time a Grey Shrike was shot at Nutbourne, near Emsworth, and a Rough-legged Buzzard at Wittering. I saw both specimens, and know the gentlemen who shot them. About the 20th December a Temminck's Stint was obtained on the coast. On November 19th I saw a Marsh Harrier at the birdstuffer's, shot at Sidlesham a few days before. It was purchased by the Rev. A. Fuller, of Chichester. On December 17th a Little Gull was shot at Itchenor; and on the 27th an adult female Peregrine, killed at Bosham, was purchased by Mr. F. J. Freeland.

During the autumn migration of 1878 about a dozen Green-shanks had returned to Bosham Harbour as early as the 10th July, and a Common Sandpiper was seen at Selsey on the 15th. About the middle of August the insectivorous birds commenced their southward movement. On the morning of the 23rd, after a night of heavy rain with south-east wind, our hedgerows around Ratham were full of Common Whitethroats; and up to the 29th they were still numerous. It has always been a question with me whether such birds as these continually pass on by flitting from hedge to hedge, or whether they rest and await a

* See 'Zoologist,' 1877, p. 296.

more favourable time for their passage across the sea. Ray's Wagtail seems to pass by in short flights, sometimes dropping down in small parties amongst the cattle and sheep, and, if disturbed, continuing their southward course. This occurs from about the middle of August until the end of September. The Whinchat is moving during the same interval, and is seen in small parties of ten to twenty perching on the low hedges, or on plant-stems in our meadows—here to-day and gone to-morrow. The Turtle Dove was last seen September 24th.

By September 27th the Lesser Redpoll had arrived, and throughout the early part of October was plentiful, feeding on the seed of the Willow Herb (*Epilobium*) growing by our ditches, their usual winter food being the seed of the alder.

For the last two summers (1877-8) a pair of Pied Wagtails built their nest and reared their young on the framework underneath a third-class carriage running daily four times to and fro between Cosham and Havant, a loop line on the South Western Railway—the distance traversed during the day being about forty miles. While the train was on its journey to Havant and back the male bird might be seen anxiously awaiting its return either on the telegraph-wires or the turn-table at Cosham Station. Last summer these Wagtails narrowly escaped a calamity, the carriages composing the train having been ordered away for renovation; but the station-master at Cosham, by making "their" carriage the last to go, just managed to avert it.

Last summer a pair of Robins reared two broods of young *in the same nest* in my garden at Ratham, nothing having been done to the nest after the first brood had flown. Robins, as well as other birds nesting in my garden, are much annoyed by Sparrows destroying their nests or thrusting their bills into the eggs and carrying them off; and Robins stand a poor chance if they do not conceal their nest well. This may, perhaps, account for the same nest being twice used. On the other side of the garden, a pair of Robins quickly took possession of an old pitcher purposely lodged in a tree for them; but no sooner was the nest finished than the Sparrows destroyed it. Blackbirds, Thrushes, Wagtails, and Flycatchers have all in their turn been disturbed by these pugnacious birds.

Two pairs of Robins occupy my garden this winter, each keeping their respective sides, neither pair venturing far over a

middle path without a chase from the other, ending either in an engagement or retreat. One Robin out of the four is much tamer than the rest, coming close to me, often settling on the handle of a spade or prong when stuck in the ground unused, and keeping a sharp look out for worms or insects turned up, not refusing worms when thrown to him, nor appearing frightened by the action of the hand in throwing. If, however, my work lies on the opposite side of the garden, my friendly Robin keeps aloof, cheering me only by his song. Bird as well as man has his frontier line to protect. Occasionally a Gray Wagtail, which is otherwise allowed occupation, is sharply served with notice to quit the land of Robins. The Grey Phalarope last autumn was conspicuous by its absence, not a single specimen having, to my knowledge, been seen here.

Referring to my note in 'The Zoologist' for October last (p. 392), I have to report that four other Hoopoes, in addition to the two there recorded, were shot at the same place. The first two, sold to the Rev. A. Fuller, of Chichester, were killed by a fisherman named Grant, on August 22nd, at a place between Sidlesham and Selsey, called Woolhouse, or, in the vernacular, "Ooollas." On the 24th two others were shot there by Mr. Woodman; the remaining two on the 31st of August and the 1st of September—one of these also by Mr. Woodman. I saw them at the birdstuffer's, and, with one exception, I believe they are all old birds, and this one may have been a bird of the year, but I am not sure. The late Mr. Yarrell, in his work on 'British Birds,' writes, "It seldom makes its appearance in this country till after the breeding season is over; and the period of the year in which this bird most commonly occurs is in autumn." My own experience hitherto has been just the reverse. The only autumn-killed specimen that I have recorded was procured towards the end of September, 1866. Mr. A. E. Knox, in his 'Ornithological Rambles in Sussex,' mentions three instances of the occurrence of the Hoopoe in September. The usual time of their appearance in the spring is from about the middle to the end of April, just the time when the greater part of our summer visitors are arriving. Two instances are recorded of the Hoopoe having nested in Sussex: one is mentioned by Yarrell as having occurred near Chichester; the other by Mr. Knox as having been observed at Southwick, near Shoreham. There is little doubt

that they would oftener remain to breed here if unmolested, and it is much to be regretted that they are not allowed the opportunity of doing so. The stomach of one which I examined (killed April 18th, 1865) contained the remains of twenty to thirty larvæ of beetles, apparently those of the cockchafer, *Melolontha vulgaris*; many of them almost perfect, and nearly one inch and a half long.

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

BY JOHN GATCOMBE.

ON October 7th, on which day it was blowing very hard, I observed Swallows for the last time in the neighbourhood of Plymouth. The following day many Cormorants, Shags and Terns appeared in our bays and estuaries; but I saw no Phalaropes, except one said to have been obtained on Dartmoor. Many Terns, both Common and Arctic, arrived, and several were brought to our birdstuffers. The bill of one of the young Arctic Terns I examined was the shortest I ever saw, in comparison with the size of the bird, measuring only three-quarters of an inch from the tip to the commencement of the feathers on the brow, and an inch and a quarter to the corner of the gape.

On October 12th two Northern Divers were seen in the Sound—one, from the description given, an adult, the other a young one. My informant said that the old bird had a black and white ring round the neck, and when approached continually rose and flew a short distance, at the same time calling as if to entice the young one away, but the latter would not rise. However, they both managed to keep out of shot by diving and swimming. When chased by a boat, I find Northern Divers rarely attempt to escape by flying, but I have known them do so in a few instances. It is not uncommon to see them circling high overhead, apparently on the look out for a good place to alight, or bound for a long journey. On a very calm day, about the commencement of spring, many years ago, I remember having seen between twenty and thirty Northern Divers in Plymouth Sound, apparently in pairs. They continually called to each other on the eve of going below, and again on rising to the surface. These birds appeared to have collected previous to their departure for the north. We chased

many for about two hours, but without any satisfactory result. Their cry is very melancholy, especially when wounded or hard pressed. Many writers assert that the action of this bird in going under water cannot be easily explained in words. The numbers that I have closely watched seem to me, when quietly fishing in bays, to first sink the body and then to give a simple plunge forwards, with the neck a little arched and the bill pointing downwards; but if unexpectedly disturbed or closely pursued, there is, of course, more of a sudden start and splash. Mr. Saxby, in his excellent work on the 'Birds of Shetland,' says that "the Northern Diver can, in smooth water, see a boat and its moving shadow from beneath the surface for a considerable distance, and hence the bird is more frequently dodged and shot during a breeze." But I have met with several instances in which the bird when pursued—and in very calm water, too—has come up close to the boat, and, on one memorable occasion, right under the angle formed by the oar from the gunwhale to the water, and this being the first and only adult in full summer plumage I had ever pursued, quite took away my breath. We lost it after all.

A fine Common Buzzard and several Herons were received by the birdstuffers during the second week in October. The latter were plentiful in our estuaries and rivers, and I have always remarked that severe cold weather has a great effect on Herons, and on Kingfishers as well. Shortly afterwards there were many Widgeon and two young Red-breasted Mergansers in our market, and three Grosbeaks from different localities near Plymouth, and one from Milton Abbot. This species is certainly not at all common in the county. I observed some Oystercatchers flying up the harbour, uttering their peculiar cry, which Mr. Saxby says the Shetlanders liken to the words "my feet." On the 22nd I observed the last Wheatears—not very late. I may here mention that a correspondent in the October number of 'Science Gossip' sends a note on the occurrence of the Russet Wheatear, *Saxicola stapazina*, in Lancashire—a species the occurrence of which I have for years anticipated, and longed to hear of on our side of the channel, wondering why a straggler, at least, should not occasionally appear at the same time with its near relation, *S. ænanthe*. Many Short-eared Owls, and one Long-eared, were killed about this date near Plymouth, and a Reeve on Dartmoor. A Brent Goose, some Redshanks, Herons and Curlews were

exposed for sale in the market, and a Snow Bunting was killed on the 26th. Snipes, both "full" and Jacks, were plentiful, one of the former weighing six ounces.

November 1st was very cold, with the wind N.E. True to their time, Black Redstarts made their appearance, and several were caught, and doubtless starved to death by the birdcatchers, who, I am vexed to say, have become a nuisance in the neighbourhood of Plymouth. One Redstart was killed by a coast-guard man with a single ball from his rifle. This man is a gunnery instructor, and the best shot I ever met with. Divers and Cormorants, swimming within any reasonable distance, stand not the least chance of their lives with him. I have seen him disable a Shag with the first ball, and knock it almost out of the water with the second. He sometimes shoots at a Kingfisher sitting on a rock, and aims so that the ball may not directly strike the bird, but so nearly that the splinters of the rock kill it without much injury to the plumage. The Redstart's head, in the case above referred to, was cut completely off. I once saw another man, a gunnery instructor also, kill a Speckled Diver with a ball between three and four hundred yards off at least. Indeed few people have an idea of the perfection these men have arrived at in the use of the rifle.

During the first week of November a pair of Scaups, a Scoter, and an old male Cornish Chough were killed and brought to Plymouth for preservation, and there were some Grey Plovers and Knots in the market. A warrener from Dartmoor told me that a Peregrine Falcon had for a long time frequented the place, and that he had often seen it knock down Curlews and Wood Pigeons on the moor, but that he could never manage to get a shot at it. A Dartford Warbler was killed and sent up from Cornwall by Mr. D. Stephens; also a very pretty variety of the Water Rail, with a pure white patch covering the back of its head. About the same time I examined a beautifully marked brown and white variety of the common Thrush. Several Northern Divers were killed in the neighbourhood during November, and I heard Whimbrels flying up the harbour by night—rather late in the season for these birds. Kingfishers were very numerous, and almost daily killed, I am sorry to say, by gunners. A fine Merlin, two Northern Divers, a Crested Grebe, and three Herons were brought in to a Stonehouse birdstuffer. Some Turtle Doves also

were obtained in this neighbourhood. An ornithological friend, the Rev. G. Robinson, writes me from Ireland that his son had killed some Curlew Sandpipers on Lough Neagh, a new Irish locality for this species.

Early in December the weather was exceedingly severe, and the birds suffered greatly. The following species were brought in to the bird-preservers:—Two Merlins, a Grey Plover, several Razorbills, a Cormorant, and two Northern Divers, making altogether eight of these last-named birds brought in since the commencement of November; also a Slavonian Grebe, a species which has become scarce of late years, but was formerly often seen in our bays and estuaries during severe weather. It varies much in size, some specimens being half as large again as others, and the upper plumage of the larger birds is generally much darker. During the early part of the month our markets were filled with wildfowl, among which were Woodcocks and Snipes in great profusion, Redshanks, Curlews, Mallards, Widgeon, Teal, Shovellers, Pochards, Scaup and Tufted Ducks, both young and adult, but I did not see a single Sheldrake or a Grey Goose of any kind. On the 13th, however, a female Egyptian Goose was shot and sent up from Cornwall to be preserved, and the next day another, I believe a male; both were fine birds, neither of them showing the slightest trace of having been in confinement. On the 18th there was a Corn Crake, in very poor condition, in the market. Water Rails were exceedingly plentiful, but Moorhens and Coots scarce. Four Oystercatchers were killed on the coast, and I found the stomach of everyone full of limpets. The severe weather had great effect on the Curlews, numbers of these usually wild birds having been shot. Some which were taken alive I bought and restored to liberty. Kingfishers also suffered greatly. Numbers of Herons and a Bittern were killed, the last-named I believe in Cornwall; its stomach, which I examined, contained nothing but the fur of water rats and mice, rolled up in small, hard, oblong pellets.

During December the gardens, even in the middle of the town, were crowded with Blackbirds, Thrushes, Redwings, Starlings, and even Fieldfares, which were regularly fed by many kind-hearted people. Hundreds of Blackheaded Gulls were to be seen daily swimming and dipping in the water close under our quays and wharves, some of them actually settling on the sheds, apparently

in a most pitiable plight from starvation; and, strange to say, I noticed one among them with a head as black as it usually is in summer, with the exception of a few very small white feathers appearing here and there, and these only to be made out through a powerful telescope. This happened on December 22nd.

ORNITHOLOGICAL NOTES FROM WEST CUMBERLAND.

BY C. A. PARKER, M.D.

THE district in which these notes have been made may be roughly described as bounded, on the north by St. Bees Head, on the south by the Muncaster Fells and Black Coombe, on the east by Scafell and its adjacent hills, and on the west by the Irish Sea. It is watered chiefly by the rivers Eden, Calder, Irt, Mite, and Esk, the three last uniting in a common estuary at Ravenglass, while at the foot of the hills lies Wastwater, the deepest lake in Britain. So varied a district affords good hunting grounds to a naturalist.

To begin at the mountains with the birds of prey. The Eagle we have no longer: I saw the last of the race some years ago at Ambleside, very badly preserved. The Peregrine is still occasionally seen on the hills: a fine hen bird was brought to me on the 22nd November last. It had forsaken the fell for a richly stocked preserve, where it no doubt had lived "in clover" till it came within range of the keeper's gun. Another keeper told me he shot one in the spring on Birker Fell, and I saw one myself near Wastwater last May. The Buzzard is common here, and almost invariably nests on the precipices, the solitary instance I have been able to discover of a nest in a tree being thought quite a curiosity by the country people. These birds do good by destroying a great number of vipers, but I do not think they have pluck enough to touch grouse, though I have known one carry a hare in its claws, which must have been a heavy burden for a bird of its size. A Buzzard, which was taken when young from the nest, is kept in solitary confinement at Newton Manor. Last spring it laid two eggs, very oval instead of the usual round shape, and only very faintly marked with reddish brown. These were taken, and three hen's eggs substituted, which were duly hatched, two of the chickens being quickly devoured by their fierce

foster-mother; the third was reared. The Merlin is common on the fells, where it breeds. I have known of two or three nests lately. The other small hawks are very abundant.

In December, 1876, a specimen of Tengmalm's Owl was shot in one of the Newton Manor coverts, in Gosforth parish, by the keeper. It was an adult bird, in full plumage, and is now in the collection of the Rev. C. F. Smith, of York. The keeper told me he thought it had a mate, but he never saw it after the first was killed. The White, Tawny, and Long-eared Owls are common, especially the latter. I have known nests of all three this year. The Short-eared Owl does not occur nearer than Barrow, where it is not infrequent on Walney Island.

The Raven is perhaps more abundant in Cumberland than in any other English county, especially about Scafell. I knew of two nests last spring, one of which was perfectly inaccessible, and though my friends and I made several toilsome journeys to the other, and succeeded in reaching it by aid of a rope, we got nothing for our pains but a sight of the old birds.

The Great Grey Shrike I have seen once only. The Red-backed Shrike is common, also the Nightjar, and a pair of Crossbills were seen in Wastdale some years ago. The Kingfisher is usually rare, but I have heard of four or five this year, two of which I am sorry to say were shot, and, after having gone the round of the village, found their way to my collection. The Snipe breeds here often: I found a nest by the side of the river Irt last season with four eggs, and am sure there were two or three more nests near. A Woodcock's nest with four eggs was found in one of the Irton Hall covers in May, 1877.

The Dotterel is sometimes seen on the grassy tops of the Screes mountains which border Wastwater, but I have never been fortunate enough to see one myself.

In June, 1877, a Waterhen was brought to me of a light fawn-colour all over except the usual white markings: the tail is lighter than the rest of the body, the legs light-coloured, the bill natural. It was shot on Hallsenna Moor, in Gosforth, by a gamekeeper. On the 5th December I saw a Rook with a large white patch on the left wing. I have also in my collection a Song Thrush, killed in the neighbourhood, with a white blotch on the back of the neck and shoulders, and Dr. P'Anson, of Whitehaven, informs me that he lately saw in an adjoining parish a perfectly white Sparrow.

Albino specimens of other birds seem to be frequent. During the last two years I have seen six pied Blackbirds:—(1) spotted all over; (2) white on both sides of the head—both in Irton parish; (3) white wing, cheek and spot on the back; (4) white head and greater part of body, now in my collection; (5) broad white ring round neck and shoulders; (6) white feather on shoulder and another on the side—all four in Gosforth parish.

Coming nearer the shore, we have in the winter large flocks of Golden Plover and Turnstones. I fired into a flock of birds last winter, and on picking up the seven slain found they were all immature Turnstones. I was sorry to have killed so many, but made the best of it by having five preserved in a group by Hope of Edinburgh.

Of Herons we have plenty; they breed at Muncaster Castle, and may be seen on the shore in flocks of as many as twenty. A Bittern was shot four years ago at Nethertown, and the Water Rail is occasionally seen.

In November, 1877, six Swans appeared on Braystones Tarn, which were supposed to be wild. They remained about the place for about three weeks, and last month turned up again on Bassenthwaite Lake.

Of Ducks we have a varied list. Several years ago a couple of Ferruginous Ducks were killed on Braystones Tarn; the Eider Duck and Scaup have been shot on Wastwater, while the estuary at Ravenglass attracts many species in the winter. Between the river Irt, which forms part of the estuary, and the sea, is a lonely strip of land, about a mile and a half long and a third of a mile broad, consisting entirely of sand-hills. Here the Sheldrake breeds in the rabbit-holes; also the Oyster-catcher, Common Tern, Lesser Tern, Ringed Plover, and numbers of Black-headed Gulls. Wild Duck, Teal, and Widgeon abound, and the Goosander occurs sometimes. A good number of Cormorants are to be seen there through the day: towards evening they fly back to St. Bees Head, where they are said to breed, and the Green Cormorant as well.

A Bernicle Goose was shot on the Irt on the 1st November last. It was alone and very tame. One leg had been broken at some former time, but was quite healed. It is now in my collection. A great number of wild geese have been in the neighbourhood for the last three weeks: three times flocks of

more than twenty have been seen together. When only four or five were together they were not wild, having in two instances been within a stone's throw of the observer. Some, but not all, were evidently Bernicle Geese, from the descriptions I heard of them. The Kittiwake, Herring, Greater and Lesser Black-backed and Common Gulls are all to be seen in varying numbers, and when shooting on the shore on November 23rd, 1877, the Rev. C. F. Smith was lucky enough to secure a specimen of the immature Glaucous Gull.

I have never seen the Guillemot or Puffin alive about here, but I have found both birds dead on the shore in a sufficiently fresh state for stuffing.

Among the smaller birds of the district the Mountain Finch and more rarely the Snow Bunting may be mentioned.

OCCASIONAL NOTES.

VOYAGE OF THE 'ALERT' TO THE STRAITS OF MAGELLAN.—The following extracts from a letter addressed to Captain Feilden by Dr. R. W. Coppinger, Surgeon and Naturalist of H.M.S. 'Alert,' dated Monte Video, 30th November, 1878, will be read with interest. The 'Alert,' under the command of Captain Sir George Nares, K.C.B., is now engaged in completing the surveys of the Straits of Magellan:—"As our voyage so far has been a rather hurried one, I have had, as you may imagine, but few opportunities of doing Natural History work, either ashore or afloat. The only places as yet touched at have been Madeira, St. Vincent (Cape de Verde), and our present anchorage. During the few days of our stay at Madeira, we dredged several times in the 5—35-fathoms belt, at various stations along the coast for about seven miles to the eastward and westward of the town of Funchal. It did not prove a very productive region in the molluscan way, as I only got representatives of about seven genera of shells, besides a few Annelids, Crustaceans and Echinoderms. *Serpulae* were very abundant. At Porto Santo (St. Vincent) I spent one day dredging over the 3—12-fathom belt, and there I obtained some fine specimens of *Strombus*, and great numbers of a large blunt-spined *Cidaris*. Of littoral shells, living and dead, many were picked up. On our way down the South Atlantic we took a few deep-sea soundings in 2000 fathoms and thereabouts, far from the track of the 'Challenger,' and these have furnished me with little sackfulls of globigerina ooze. On reaching the position of the Hotspur Bank, in lat. 17° 32' S., long. 35° 46' W., we put the dredge overboard in

35 fathoms, thereby bringing to light a mass of dead coral honeycombed by *Pholades*, and containing within its recesses a variety of Crustaceans, Annelids, Echinoderms, Algæ, &c. Our next dredging operations were over the Victoria Bank, in lat. $20^{\circ} 42' S.$, long. $37^{\circ} 27' W.$, when the principal feature was the acquisition of numerous examples of a pretty little glassy-spiculed sponge. On the 14th October, when in lat. $30^{\circ} 41' S.$, and one hundred miles from the Brazilian coast, we met with one of those extraordinary flights of moths so characteristic of the region. Conspicuous by their numbers and by the pertinacity with which they clung to the sails, and, in fact, to every available dry substance, was a species of large *Sphinx*. Of moths I captured altogether about fifteen species, and of butterflies two or three. The ship presented quite a gay appearance amid these swarms of insect-life. Owing to the rapid passages which we have hitherto made, I have had comparatively few opportunities of satisfactorily plying the tow-net. A speed of three or four knots soon wears out the net, and is, moreover, destructive of the fragile organisms sought after. I have, however, obtained a fair collection of pelagic Mollusca, minute crustaceans, and protozoa, all of which have been carefully preserved and labelled. I do not expect to meet with many birds worth preserving until we reach the inner waters of the west coast of Patagonia; but from these, as well as from the Pacific Islands, I hope to send specimens. There is a certain pair of lonely uninhabited islands in the South Pacific known as St. Felix and St. Ambrose, and which, as they lie far away from the main groups and four hundred and eighty miles from the American coast, might be expected to possess a fauna and flora exhibiting peculiarities similar to those of the Galapagos group. I am in hopes of being able to explore these islands during the southern winter of 1879—*i. e.*, when the rigour of the weather compels us to suspend our Magellan operations and proceed northward to Coquimbo. Sir J. Hooker has already pointed out to me that the flora of St. Felix is quite unknown, and that its investigation would probably prove of great interest. Any information, therefore, concerning the Natural History of those islands would, during the next year, prove most useful and interesting to me. Sir George Nares is doing his best to make everyone comfortable, and gives me every assistance in his power. I do not expect any great things in Magellan, as it is such an unproductive region, and has already been so thoroughly worked up, but in the Pacific I trust we shall have scope for much useful work."

THE ROE-DEER IN DORSETSHIRE.—In your review of 'The History of Glanville's Wootton,' by Mr. Dale (Zool. 1878, p. 461), you notice a statement of the author's that the Roe-deer is rare. This may possibly be the case, if he refers merely to the neighbourhood of Glanville's Wootton, but not to the county of Dorset. I venture to say there are no less than one

hundred and twenty head in the Milton, Whatcombe and Houghton Woods, which fringe the southern side of the Vale of Blackmore from Stoke-Wake to Melcombe Park and the Grange Woods westward—the number being merely a question of preservation or non-preservation. The late Lord Dorchester, in 1800, turned out a few pairs in his woods at Milton, from whence their descendants dispersed in a marvellously short space of time, especially in a south-westerly direction—their shy, secluded habits, as might be expected, causing them to avoid the open country and move only from one neighbouring covert to another. I doubt if they have ever voluntarily crossed the broad expanse of down and arable which intervenes between these woodlands and those beyond the valley of the Piddle. About the year 1829, when Mr. Pleydell gave up his pack, after hunting Roe-deer exclusively for sixteen years, he permitted Mr. Drax to capture several deer and turn them out in the Charborough Woods. From this second centre they have increased in numbers and have wandered far and wide, from Moreton to Warmwell in the Valley of the Frome, and from Hyde to Houghton in that of the Piddle. Their extreme eastern extension at present is Lychett, and they have been met with as far west as Hook Park. Their rapid distribution over these two parallel tracts is attributable to the fecundity of the doe, which produces two and sometimes three fawns at a time; and in proportion as the area of their native home becomes insufficient to maintain the increasing numbers, they are compelled to seek fresh feeding grounds. Professor Newton writes:—"There were plenty a few years ago in Bere Wood, and though I think that of late they have been a good deal killed down just there, there are still some in that wood and in the Bloxworth woods that adjoin it and form an almost continuous wooded tract to Morden Park in the east. There are also a good many Roes in the Moreton Woods, lying to the south of the Piddle. Although the large farmers generally do not find the Roes injurious, the small holders complain of them, and I suspect destroy a good many. To this cause I attribute their comparative scarcity within the last three or four years about Bere Wood. The Roes are said to nibble the potatoe plants as they are sprouting above the ground, and so check their growth, if they do not wholly spoil the crop." Generally, however, they content themselves with browsing upon the underwood and the scanty herbage beneath. At fawning time the doe separates herself from the rest of her family, which usually consists of four or five in number, and remains secluded until her young are able to take care of themselves, which is not long, for in a fortnight they are as active and agile as the parent. Soon after her return, her offspring of the previous year usually disperse and form the nucleus of a fresh family. The bucks shed their horns in October and November; they are speedily replaced, and in February the "velvet," or rough skin which protects them in their soft state, disappears. In

December last, my son picked up two pairs of horns, which were lying together in one of the rides of a wood, and appeared to have been removed from the heads of their owners by violence, as the hair remained attached to their bases. It is probable that an encounter between two bucks occurred at this spot, and the weakened hold of the horns upon the skull yielding to the force of the charges, left the two combatants hornless. As the beams of the four horns were exceedingly bossed and deeply pitted, and the summits well antlered, they must have belonged to full-grown deer. We occasionally find a single horn in the rides, which I have attributed to the work of a Fox, as it is usually placed on an ant-hill or slight eminence, with indications of the recent presence of Reynard. It is well known the Fox and Stoat will drag their prey from the covert to an open spot and there devour it. A recently shed horn may possibly partake of the sweet scent of the deer, which, attracting the Fox, he carries it out, but on discovering his mistake leaves it to seek more palatable food. With regard to Mr. Dale's statement that the Roe-deer are coursed by greyhounds, this does occur, I know, sometimes, but only exceptionally; and indeed it cannot be otherwise, for they usually confine themselves to the large woods. When a deer has been observed to enter a small detached covert which is either unpreserved or under the control of a person who keeps a greyhound or a lurcher, the owner will have it drawn, after posting his dog at some avourable point to catch the deer as it endeavours to escape to the main covert, which, unless very close at hand, is fatal, for the greyhound is by far the fleeter of the two, and the roe is unable to double like a hare, and so elude the fatal gripe.—J. C. MANSEL-PLEYDELL (Whatcombe, Dorsetshire).

YOUNG OTTER IN DECEMBER.—On the 28th December last, Mr. T. E. Gunn, of this city, showed me a young Otter which was taken alive out of a hollow tree at Cossey, on the morning of that day. It weighed, when alive, nine ounces and a half, and measured eleven inches and a half from its nose to the tip of its tail. Its closed eyes and toothless gums showed that it was not many days, probably not many hours, old.—T. SOUTHWELL (Norwich).

STOATS AND THE LATE SEVERE WEATHER.—The severe winter seems to have had great effect on the colour of the common Stoat, *Mustela erminea*. Three specimens perfectly white, with the exception of a little brown on the upper part of the head, were brought to our birdstuffers in one week. Such specimens are occasionally met with in this neighbourhood during comparatively mild winters, but so seldom that, strange to say, neither of the persons who received those referred to remembered to have had one before.—J. GATCOMBE (Durnford Street, Stonehouse).

THE SQUIRREL IN SCOTLAND.—Mr. J. A. Harvie Brown, of Dunipace House, Larbert, N.B., writing to the 'Journal of Forestry,' states that he is

at present engaged in tracing the past and present history of the Squirrel in Scotland; its former distribution there before it became extinct or nearly so; and its increase and spread, and the lines of its advance from the different centres of restoration. Localities where it has been introduced, known to him at present, are four in number—Dalkeith, Minto, Dunkeld, and Beaufort Castle, Inverness. The third he considers requires authentication, and the date of the first seems not laid down with sufficient exactitude. On any of the above points he would be glad of information, as well as of statistics of the amount of damage done in one season. Returns of the numbers of Squirrels killed on any one (or more) large estate in each county of Scotland would be desirable, and information regarding the destruction done to eggs of game or other birds, from personal and actual observation, with exact dates of first appearance at any localities in any part of Scotland, would also be interesting. The Gaelic name of the Squirrel is “fheoraig.”—ED.

NOTE ON SHREWS OBSERVED IN NORFOLK.—In July, 1878, a specimen of the Lesser Shrew was captured in a tool-house at Northrepps, which is only the second Norfolk specimen of this Shrew, which, so far as I know, has been satisfactorily identified, the first having been killed at dusk, June 14th, 1874, on Sparham Heath, by Mr. Frank Norgate, and recorded by him at p. 465 of the second volume of the ‘Transactions of the Norfolk and Norwich Naturalists’ Society.’ On December 20th, 1878, a specimen of the Common Shrew, not quite full-grown, was caught in a mouse-trap, baited with cheese and placed under the boards of the floor in a room on the second storey of Northrepps Hall—the severe cold which then prevailed having probably caused the Shrew to seek the shelter of so unusual a situation. This specimen was also remarkable for the almost black colour of its fur, both on the back and still more on the under parts, being the nearest approach that I have seen to a melanism of this species. Mr. F. Norgate kindly allows me to add to the above note two recent observations [of his own. On April 30th, 1878, he saw at Coltes-hall, in Norfolk, nine Common Shrews, all full-sized with the exception of one rather small one, which had been killed by a boy, who stated that he had found them all in one hole at the bottom of an old gate-post, together with the skins of two others, which may perhaps have been killed and partially devoured by their companions. On the 18th November, 1878, Mr. Norgate saw at Sparham a black and white Shrew diving. This was probably a specimen of the typical *Sorex fodiens*, which is a much rarer animal in Norfolk, and I expect also more exclusively aquatic, than the closely allied Oared Shrew, though both races are referred to the same species in the last edition of Bell’s ‘British Quadrupeds.’—J. H. GURNEY (Northrepps, Norfolk).

MORTALITY AMONGST SHREWS.—I think it has not yet been determined why so many Common Shrews, *Sorex araneus*, are constantly found dead on roads and foot-paths. For many years I have observed them here at all seasons; and it is a remarkable fact that so many are seen dead on foot-paths and roads. If they are as numerous in woods and tall herbage, there must indeed be an immense number of them. Perhaps some of your correspondents may be able to throw a little light upon the subject.—JAMES MURTON (Highfield, Silverdale, Carnforth).

[In the second edition of his 'British Quadrupeds,' p. 147, Mr. Bell observes:—"So many may be found at that season (early autumn) lying dead in footways, or on other bare ground near their haunts, as to have led to the belief among country people that the Shrew could not cross a public way without incurring instant death. We confess ourselves wholly unable to furnish any explanation, having failed to discover any cause of death."—ED.]

THE MAMMALS OF SHAKESPEARE.—Mr. Reeks has included the Sable amongst the mammals noticed by Shakespeare (Zool. 1878, p. 245), but I think the reference is a mistake. I remember reading many years ago, in a magazine article on new readings of Shakespeare that "Sabelle," in Shakespeare's time, was a colour,—“flame-coloured” or bright red,—and that the word had been derived from a certain Queen Isabelle of France who had red hair. This meaning certainly makes Hamlet's remark much more striking. To propose to wear dark fur in preference to black does not seem much of a contrast; but, if the above be correct, then his speech is strong and bitter enough:—"So long? Nay, then, let the devil wear black, for I'll have a suite of *sabelle*"—*i. e.*, bright red.—JOHN E. ROBSON (Hartlepool).

[The colour which the French call "Isabelle" is a brownish yellow, the hue of unwashed linen, and is said to owe its name to the Infanta of Spain, daughter of Philip the Second, who in 1601 made a vow not to change her linen until her husband had captured Ostend. The town was not taken until 1604, by which time it is not surprising that the linen had assumed the above-named hue. An account of the incident *apropos* of the isabelline colour of certain birds, and a portrait of the lady, will be found in the late Mr. Dawson Rowley's 'Ornithological Miscellany,' part iv., p. 264.—ED.]

LARGE RORQUAL ON THE COAST OF CORNWALL.—On January 28th a large Rorqual, *Balænoptera musculus*,—reported to have been floating in the channel many days previously, surrounded by a multitude of sea-birds,—was towed in by a fleet of boats belonging to the fishermen of Looe, on the coast of Cornwall, where it has since been "flinched," and its blubber boiled down for oil. Some of its dimensions were as follows:—Extreme length 64 feet

7 inches, and the circumference of the body (as well as it could be taken), immediately behind the pectoral fins, 38 feet; pectoral fins, 6 feet; and expanse of tail, 14 feet. Its belly was much inflated, and the edges of the plaits or folds thereon so eaten in holes—or, as it were, so completely honey-combed by the birds' bills—as to be in some places almost altogether obliterated. The sharp ridge on the body near the tail was also mutilated in the same manner. The longest plates of “baleen” were fully three feet; including the fringe, and of a dark slate-colour on the outer edges, striped and gradually shaded off to yellowish white on the inner edges. The back was almost black, smooth, and somewhat polished, shaded to lead-colour on the sides where meeting the cream-colour of the belly, which part was probably white before it became changed by decomposition. Arriving at Looe on the morning of the 31st, I found that the belly had unfortunately been cut open and emptied of its contents, thereby causing such a complete collapse that the proper form of the whole front part of the huge animal was entirely destroyed. My friend Mr. Clogg, of Looe, in an interesting note on the occurrence of this whale, states that the upper jaw, was from angle of mouth to tip of nose, 11 feet 6 inches in length; under jaw, 14 feet, and that the roof of the mouth was of a beautiful rose-colour, the under part being of a dull cream, marked with longitudinal lead-coloured lines about half an inch in breadth.—JOHN GATCOMBE (Lower Durnford Street, Stonehouse, Devon).

PILOT WHALE ON THE NORFOLK COAST.—On the 30th January last a specimen of the Pilot Whale was found dead on the beach between Trimingham and Mundesley, on the Norfolk coast. It was a female, and appeared not to have been dead many days. It was not a large specimen, as will be seen by the following measurements, for which I am indebted to the kindness of my friend, Mr. Thomas Southwell, of Norwich:—

Total length in straight line	-	-	-	13 feet 6 inches.
From the upper lip along the curve to the spring of the dorsal fin	-	-	-	4 „ 8 „
From the anterior portion of the dorsal fin to the notch of the tail	-	-	-	7 „ 4½ „
Height of dorsal fin	-	-	-	0 „ 11 „
Length of flipper along the anterior edge	-	-	-	3 „ 3 „
Greatest breadth of flipper	-	-	-	0 „ 8 „
Breadth of tail	-	-	-	3 „ 0 „
From the blow-hole to the upper lip along the curve	-	-	-	2 „ 0 „
„ to the eye	-	-	-	1 „ 1½ „
„ to the angle of the mouth	-	-	-	0 „ 3¼ „

This specimen agreed with the figure in Bell's ‘British Quadrupeds,’ except that the upper edge of the dorsal fin appeared to be somewhat more prolonged and the posterior edge more curved. I believe that this species,

Globiocephalus melas (Trail) has not been previously recorded from the coast of Norfolk.—J. H. GURNEY (Northrepps, Norwich).

WILDFOWL IN COUNTY MAYO.—In apparent anticipation of the severe winter, some of our migrants appeared earlier than usual this season, Wigeon being seen near Bartragh on the 22nd September, fully a fortnight earlier than last season. A Spotted Redshank visited this locality last autumn, and as I was walking along the shore, on the 22nd September, I heard it calling loudly for some time from the favourite haunt amongst the islands near Roserk Abbey. It must have left the neighbourhood shortly afterwards, for although I kept a sharp look-out I did not see or hear it again. Unless it was killed by one of the shore-shooters I do not think it would have disappeared so soon after its arrival, for those I have previously seen here generally remained for some weeks about the islands. When out in my punt near Bartragh, on the 25th October, I observed a small grebe swimming in the channel close to Baunros. I at first took it for the rare Eared Grebe, but on shooting it found it to be an immature specimen of the Slavonian Grebe, the first example of the species I ever met with here. On the 29th October I was fortunate in obtaining from a game-dealer in Ballina three fine specimens of the Gadwall, a duck so rare in this district that it has only come under my notice twice previously. The three in question were shot the evening before near Roserk Abbey. Two of them were male and female, in the beautiful adult plumage, and the third was a young male of the year, just beginning to assume the grey wavy feathers. These birds were probably part of a flock of ten or twelve that I saw near Baunros a few days before, and which I at first took to be Pintails as they flew rapidly past and alighted on the sands. A heavy northerly gale having been blowing for some days, I went down to Ennis-crone on December 30th to look out for any water-logged birds that might have been driven ashore by the storm. I found several, as I expected, namely, an old and young Gannet (the latter alive), some young Razorbills and Guillemots, and six young Puffins, some of which were alive, but so utterly exhausted that they died shortly after I picked them up. As I returned along the Moyview shore I found an adult Puffin and two Fulmars in fine plumage. The plumage of one of these was so dry, and the eyes appeared so fresh and full, that it could not have been dead more than a few hours when I found it, and had most probably drifted while still alive, though in an exhausted state, into the river with the flowing tide.—ROBERT WARREN (Moyview, Ballina).

FURTHER NOTES ON MIGRATION.—On December 17th a single wild Swan passed the Tees-mouth Buoy-lightship. On the 18th, six—namely,

three mature and three immature. On the 19th, fourteen Swans, one Canada Goose, and two great Northern Divers, a large flock passed over Flamborough also on the 19th. Swans appeared in the Humber during the same week. On the 16th December a well-known punt-shooter near the Tees-mouth killed at one shot from his punt-gun, fifty Dunlins, twelve Stints (?), nine Curlews, and seven Godwits. On the following day the same man, also at one shot, killed ninety-seven Stints. On the 7th January a large flock of Brent Geese passed the Tees-mouth. From the 17th to the 20th November immense numbers of the *Limicola* passed Heligoland. Mr. Gätke writes:—"November up to 17th, storm from the south, evening almost calm, slight current of air from the east. At 9 P.M. *Charadrius squatarola* vel *helvetica* passing in countless numbers, not only overhead, but in a broad front extending as far as the ear could perceive the faintest sound of their call-notes, to both sides of Heligoland; direction of flight from E. to W. 29th to 30th, N.E., *Pyrrhula vulgaris*, about half a score; none seen here for many long years. Night from 19th to 20th, *Numenius arquatus*, from 3 to 6.20 A.M. The whole atmosphere one mass of these birds, the noise of their call-notes quite unearthly and bewildering; countless smaller waders mixed with them." The loss amongst the birds in this district during the severe weather in December was enormous. The fatality was especially large amongst the Thrushes and the Redwings. Great numbers of birds were frozen on the night of Christmas Eve, when the thermometer near the ground stood very few degrees below zero, with a cutting wind. As a most extraordinary illustration of the intense cold, I had the same night two sheep frozen to death. Mr. Bailey, writing from Flamborough, says:—"During the severe weather from December 8th to the 27th enormous numbers of birds perished—Thrushes, Blackbirds, Redwings, Starlings, &c. The heavy snow having driven them from the land, they daily resorted to the shore at low water, searching amongst the sea-weed for food, and amongst the refuse of fish. When the tide rose they sought any shelter they could find near the foot of the cliffs, and scores perished. Rock Doves, Wood Pigeons, Stock Doves, and Golden Plovers have all suffered greatly. Some fishermen who had been down the cliff with ropes reported great numbers of Rock Doves dead at the foot."—JOHN CORDEAUX (Great Cotes, Ulceby).

ORNITHOLOGICAL NOTES FROM SOMERSETSHIRE.—Finding myself recently in the neighbourhood of the Somersetshire Purple Gallinule (Zool. 1877, p. 178), and being anxious to ascertain its species, I called to see it, and found it to be an example of *Porphyrio veterum*, in very perfect condition. It had been very well set up by a Bristol birdstuffer. Its owner, Mr. James Burrows, of Badgworth, told me that a sheep-dog of his was extremely clever in capturing birds, especially Moorhens, and

one day brought him this Purple Gallinule perfectly uninjured. It was kept alive for several days, but would not touch any food that was given to it, and was very fierce when any one approached it; it was, therefore, killed and sent to be stuffed. In a case adjoining the one which contained the Purple Gallinule was an Egyptian Goose, which had also been secured by the sheep-dog in one of Mr. Burrow's fields; but this was a wounded bird. I noticed that the country about Badgworth, and indeed the whole of the extensive flat between the Mendip and Brent Knoll, is intersected by numerous dykes, most of which are arched over by a tangled growth of bushes, and thus would form a safe retreat for Coots, Moorhens, &c., so that the Purple Gallinule may have been for some time inhabiting the district before it was captured by the sheep-dog on August 25th, 1875. Having heard a report that a farmer living on the flat had, not long since, shot a Crane, I called on him to gather what information he could give on the matter. The Great Western Railway runs through the great Mid Somerset level, and where it is crossed by lanes these approach it by artificially constructed mounds supporting the bridges over the line, locally termed "tips." All the bridges, lanes, and tips are precisely alike, and it was with some difficulty, and not until after one or two blunders, that I at last obtained the "correct tip," which brought me to Wick Farm, in the parish of South Brent, the abode of Mr. William Harris, who was reported to have shot the Crane. Finding him at home, I received from him the following information:—One evening in May, 1875, just as it was getting dusk, he saw a large bird alight in a field near his house. He went home for his gun, and returning found the bird in the same place, and succeeded in getting near enough to shoot it. It was very different to what we call the Common Crane, he said (meaning the Common Heron), and was altogether a strange-looking bird. The top of its head was red, and the feathers of its tail were like those of a cock; and he proceeded to give me a very good description of an adult *Grus communis*. Asked what he had done with the bird, he replied that not knowing it was of any value he had given it to his labourers, and that since then some of his neighbours had very much blamed him for not having had the bird preserved. That the cold weather which set in at the beginning of December would be of some continuance was announced in West Somerset not so much by the arrival beforehand, in greater numbers, of migratory birds from the north, as by the departure of nearly all the small birds that were with us at the time. Most of the Fieldfares, Redwings, Starlings, Finches, Blackbirds and Thrushes left us, and it was quite strange to wander over the fields and through the woods and to find them almost entirely deserted by birds. In a long day's shooting in a well-wooded district I only noticed three Blackbirds and one or two Robins, and did not see a single other small bird. The great majority had doubtless sought

the coasts to hunt for food on the salt marshes, and many had taken a longer flight to more southern countries. The few that remained behind suffered severely. One incident of the weather was the revelation that the Water Rail, locally termed "Skitty," was a common bird with us. In all the game-shops in Taunton these birds were hanging up in bunches, and one dealer told me that he was obliged to refuse to purchase any more, not finding any sale for them. The shy and retiring Water Rail is so seldom brought to bag, and is so little known in consequence by the non-ornithological public, that I actually found one once hanging up in the bar of the Railway Hotel at Yatton, waiting for some one to say what the strange bird was. In November two birds were obtained near Taunton, in localities very different to their accustomed haunts. The first was a young Gannet, which was caught by the gardener at Monty's Court on a pond; the second a young Puffin, shot on some flooded ground on North Curry Moor. Hawfinches appeared with us with the cold weather, as they usually do. While the snow was on the ground, the turnip-fields were attacked by numerous starving Ring Doves, among which were many Stock Doves, and I found the latter to be plump and in good condition, while the former were little more than bone and feather. In North Devon, Great Northern Divers were abundant at the commencement of the frost on the Taw, as were also many other species of wildfowl. Among those obtained, I saw some very perfect examples of the mallard Goldeneye. In the very cold weather during the middle of January there were many wild swans and wild geese on North Curry Moor. Mr. Foster, of North Curry, purchased a swan shot by one of the gunners, which I find to be *Cygnus Bewickii*, and I should think an adult bird.—MURRAY A. MATHEW (Bishop's Lydeard).

ORNITHOLOGICAL NOTES FROM OXFORDSHIRE.—A Great Snipe was obtained near Bampton on the 2nd September last. I am informed that five and twenty years ago, before the commons were drained, several were procured. One also was shot at Walkworth some years back. On the 8th December, when walking through a large stubble-field, I noticed a Snow Bunting in company with two Chaffinches. It is a very rare visitant to this county. When Snipe-shooting on the 14th December I procured a fine specimen of the Green Sandpiper. It was feeding on the banks of the Swere, a rapid stream in the northern part of Oxfordshire. It is more usual to meet with this species in August or early in September. The Lesser Spotted Woodpecker is still of frequent occurrence with us. Within a week I noticed no less than three, probably all different examples, as the localities were some distance apart. This bird generally searches for food on the outer branches of trees, not on the trunk. A Water Rail was shot on December 14th, and two others were seen. A Widgeon was killed on the Cherwell on the 17th. Several large "strings" of Geese have been

observed. Wild Ducks have been very numerous. It has also been a capital season for Snipe; they frequented the water-meadows in large "wisps," but Jacks have been scarce. Lapwing and Plover were plentiful, but they all disappeared before the frost set in, and have not yet returned. I have paid great attention lately to the Grey Wagtail, and I find it resident in this county throughout the year. On looking through my notes I find I noticed one or more individuals every month. It seems a very local species. I know two or three spots where it is invariably to be met with. I find Mr. A. G. More includes it in the Sub-Province 9 (Oxon, Berks, Bucks), on the authority of the Rev. B. Burgess. Although not nearly so numerous as in the breeding season, I have observed Kestrels here every day all through November and December. The Siskin and Redpoll, especially the latter, have been fairly plentiful. Ornithologists will be pleased to hear that the Goldfinch is very common with us, small flocks of this elegant bird frequenting the waste lands. In one stubble-field I saw a very large flock, containing fully eighty individuals. They are, however, scarce in the breeding season. From October to March I do not often meet with the Stonechat, but I noticed a fine male perched on the topmost spray of a furze-bush on December 4th. On November 28th I saw two Kittiwakes flying over; one had recently been killed in the vicinity. A Quail was shot here in October. I have daily noticed very large flocks of Stock Doves feeding in the stubbles. A fine male Goldeneye was shot on December 12th at Chattercut Reservoir, and a Razorbill was procured on the same day and locality. Although getting a scarce species with us, examples of the Greater Spotted Woodpecker are occasionally met with. I have recently been told of one killed in the early part of the year by a game-keeper in Broughton Park.—C. MATTHEW PRIOR (The Avenue, Bedford).

THE PAST SHOOTING SEASON AT THE SCILLY ISLES.—The late severe winter has given a fine season of sport on these islands. The return of the number of Woodcocks and Snipes killed by the Lord Proprietor, Mr. Dorrien Smith, may interest the readers of 'The Zoologist.' The following is about the summary of the bag, but I am led to believe that double the number of Snipes might have been obtained by additional and fairly effective guns:—Woodcocks, 415; Snipes, full, 545; Jack Snipes, 73; Curlew, 10; Teal, 67; Pheasants, 390; Golden Plover, 84; Landrails, 3; Rabbits, 2045; various, between 100 and 200, including one Purple Heron (immature), one Wood Sandpiper, one Green Sandpiper, Ruffs, Bar-tailed Godwit, Goldeneye, Shoveller, Norfolk Plover, Pochards, Wild Ducks, Widgeon, in more or less numbers. The best day's Snipe-shooting gave $53\frac{1}{2}$ couples, and of Woodcocks 42 birds. I need scarcely refer to the fact of the Islands having been crammed with all sorts of the Thrush tribe, as well as our indigenous birds, during the hard weather, it being always the case that in severe winters there is always

more or less an immigration southward and westward of birds in search of food and shelter—a movement, of course, entirely independent of the great autumnal migratorial movement.—EDWARD HEARLE RODD (Penzance).

RARE BIRDS IN NOTTINGHAMSHIRE.—A female King Duck was shot in November, 1877, on the Derwent, by Mr. J. H. Towle, of Draycott Hall. Mr. Harting, in his 'Handbook of British Birds,' only mentions its occurrence on fifteen previous occasions. The Spotted Crake has been very plentiful about the Nottingham meadows, where it nested last summer. One birdstuffer had fourteen and another nine of these birds, some of them quite young, sent to them for preservation. In July last I saw a Common Buzzard flying over my house. This bird is now very seldom seen in this district. A pair of Shoveller Ducks frequented the lake here all last summer, but no young ones were seen, though the place was kept very quiet. We had a dozen or more pairs of Tufted Ducks nesting round here last year, and have shot a goodly number during the present winter. Four or five pairs of Snipe also nested here. Two Little Auks were killed at Wollaton, near Nottingham, in November last, after several days of stormy weather. During the same month a Storm Petrel was killed near Nottingham. A specimen of Leach's Petrel was shot between Lenton and the Trent, towards the end of November last, by Mr. Moulton, of Old Radford. So far as I am aware, this is the second instance of its occurrence in this county, the first being in 1840.—J. WHITAKER (Rainworth Lodge, Mansfield).

NOTES FROM DUBLIN.—The recent severe frosts have proved fatal to immense numbers of birds, but Blackbirds, Thrushes and Starlings seem to have suffered most. During the eight weeks from the end of November to the middle of January my Sunday duty took me through a considerable portion of the Dublin Mountains, and I had opportunities of noticing the effects of the very severe weather upon most of our common birds. The country in November seemed to be full of Fieldfares, but they nearly all disappeared after the first fortnight of frost, seeking, no doubt, warmer quarters farther south. Missel Thrushes also vanished. The Redwings were found in the immediate outskirts of the city; whilst flocks of Yellow Buntings, Greenfinches, and even a few pairs of Bullfinches were to be met with in the suburban gardens. Rooks on several occasions were found preying on Starlings. I thought at first that these had died from the cold, but I am assured that in some cases they were killed before they were eaten by their half-famished neighbours. Of the *Paridae*, Blue Tits alone were common. A few flocks of wild geese and one flock of wild swans were seen and heard passing in the neighbourhood; but the absence of birds in the mountains, save round each farmstead, was very remarkable.—CHARLES W. BENSON (Rathmines School).

WAGTAILS OBSERVED IN HOLLAND.—Some remarks of mine on this subject in the January number (p. 11) being apparently not quite clear, I beg to add the following explanation:—The Yellow Wagtails of Europe, although considered by Messrs. Finsch and Hartlaub (Vog. Ost. Afr.) to be merely varieties of one species, are divided by Mr. Dresser ('Birds of Europe,' pt. 40) into four, as follows, the first three being those referred to by me:—(1) *Motacilla flava*, Linn., found breeding in Central Europe; (2) *M. viridis*, Gmel., only found in the high north; (3) *M. Raii*, Bonaparte, the well-known English summer visitor; (4) *M. melanocephala*, Licht., inhabiting Southern Europe. Whether this last named has a similar song to the others I do not know; but, in connection with my remarks, it is curious that Mr. Seebohm, in his notes on the Petchora birds, says of the Yellow-headed Wagtail (*M. citreola*, Pall.), "Both the call and alarm-note of this bird, as well as its low chattering song, are very similar to those of *M. viridis*." No one who has ever heard the Grey Wagtail, *M. sulphurea*, Bechst., could for a moment mistake its notes for those of *M. Raii*; and both species are very familiar to me, as they breed abundantly in this district, the former also remaining throughout the winter.—F. S. MITCHELL (Clitheroe).

NESTING OF THE PIED FLYCATCHER.—Mr. William Illingworth, bird-stuffer, of this village, but who formerly resided near Bradford, informs me that the Pied Flycatcher occasionally breeds in the valley between Thornton and Bradford. I have always considered it very remarkable since I first became acquainted with this species in Upper Wharfedale, where it breeds in great numbers [see 'Zoologist,' 1877, pp. 54, 297], that it should not be known in this part even as an accidental visitant, though the district is well wooded, in some places with fine old timber, in the vicinity of water—physical conditions which are identical with those which obtain in Upper Wharfedale, and which appear so well suited to its habits. Under the operation of the 'Wild Birds Protection Act,' which is generally respected in this neighbourhood, the breeding of the Pied Flycatcher in Airedale may be looked upon neither as an improbable nor remote contingency.—E. P. BUTTERFIELD (Wilsden).

HONEY BUZZARD NESTING IN HEREFORDSHIRE.—Recently looking over the volume of the 'Zoologist' for 1877, I see that I have not recorded the nesting of a pair of Honey Buzzards in that year; I do so now, extracting a few particulars from the notes I made at the time. The nest was built in the fork of a lofty oak in the middle of an extensive wood at Whitfield, about seven miles from this city; it was an immense structure, from five to six feet in diameter, and was formed of sticks, some of considerable size; it was a matter of surprise how the birds carried many of them; the lining appeared to be composed of leaves only; two eggs were laid. At the end of July the young ones were taken from the

nest, and traps were laid for the parents; in a few days afterwards the female was taken and sent to one of our birdstuffers, where I saw it in the flesh shortly after its arrival; the upper part of the breast was a light yellowish red, the lower whitish with dark pear-shaped spots, more distinctly marked than I have previously noticed in specimens in collections; the stomach was full of wasps' comb. Although I have seen and examined numbers of the Common Buzzard during the past ten years, this is the first example of the Honey Buzzard which I have known taken here.—J. B. PILLEY (2, High Town, Hereford).

WHITE'S THRUSH IN BERWICKSHIRE.—During the last week of September, 1878, a Thrush, supposed to be of this species, was shot by Mr. Forbes Burn at Hardacres, in Berwickshire. Not being aware of its rarity, only a portion of the bird was saved—the head and wings unskinned, with part of the skin of the breast and back—and forwarded to Mr. Brotherston, taxidermist, of Kelso, to be converted into an ornament for a lady's hat. Fortunately Mr. Brotherston took steps to try and secure what was left of it for the Kelso Museum, to which institution the owner kindly presented it. Mr. Brotherston, communicating the circumstance in a note which was published in 'Land and Water' on the first of the present month of February, remarked that the relative length of the primaries differ from the measurements given by Yarrell in his description of the specimen in Lord Malmsbury's collection. He writes—"Length of wing from carpal joint, $6\frac{3}{8}$ inches; first feather very short, $1\frac{1}{4}$ inch; the second in the left wing is $\frac{1}{4}$ inch, and in the right about $\frac{1}{8}$ inch shorter than the fourth. The second and fourth in Lord Malmsbury's specimen were equal. The third is the longest in the wing, being about $\frac{1}{8}$ inch longer than the fourth. Length of bill from gape one inch four lines. The marking on the head is also different. Yarrell says 'the feathers on the upper part of the head and neck, yellow-brown tipped with black.' In this specimen these feathers are black (becoming lighter on the basal half as they go backwards), with a yellow-brown spot about one-sixteenth of an inch from the tip. In other respects it agrees with his description, so far as can be seen." These variations suggest the idea that the bird in question may not be White's Thrush after all, but possibly an allied species of the genus. (See Prof. Newton's edition of Yarrell's 'British Birds,' vol. i., p. 255, where the distinguishing characters are pointed out.) It would be desirable, therefore, to compare the specimen in question carefully with examples of the other allied forms referred to, with a view to place its identity beyond doubt. Mr. Brotherston has since written to me to say that another bird of the kind was seen on January 19th by Mr. A. Steel, a gentleman well acquainted with all our common birds and many of the rarer ones. It was feeding on a bare sandy spot under some large willows near

Kelso Bridge. He had an excellent view of it before it took flight into Springwood Park, and, after seeing the remains of the Hardacres specimen, he is convinced that it belonged to the same species. Both birds were solitary.—J. E. HARTING.

ROOKS EATING SMALL BIRDS.—An intelligent and trustworthy farm-servant of my uncle's tells me that he has several times lately seen Rooks (Crows he calls them) both feeding on and chasing small birds in this neighbourhood. One day he saw a Rook chasing a Blackbird, which succeeded in escaping, and he showed me the remains of a Robin which he saw a Rook devouring. I have also heard from others of Rooks having been seen eating small birds during the hard weather, but have not had any opportunity of ascertaining the truth or particulars of any of these reports. I think it is only during severe weather, when Rooks cannot get their usual kinds of food, that they have recourse to this carnivorous propensity, which I do not find alluded to in any of the standard works on British Birds.—J. E. PALMER (Lucan, Co. Dublin).

[Several communications on the omnivorous habits and carnivorous propensities of Rooks appeared in 'The Zoologist' for 1863 and 1864; see pages 8762, 8816, 8884, 8951, 9043, and 9110.—ED.]

COLE TIT NESTING IN THE GROUND.—Mr. Young's experience (p. 32) as to the frequency of the Cole Tit choosing a hole in the ground as its nesting place is precisely in accordance with my own. In June, 1871, my dog found a nest containing young birds in the rotten stump of a Scotch fir, which had been broken off level with the ground: I found him scratching away at the hole, which I at first supposed to be that of a mouse. On the 9th June, 1873, I found another nest in exactly a similar situation near the same spot, and by the same means, viz., by seeing a dog scratching at it; this nest contained eight young birds, all of which had been drowned by a heavy rain. A third nest was placed in a fig-box nailed to the wall of the house, with a hole cut in it, and intended for the benefit of a pair of Tom-tits.—G. T. ROPE (Blaxhall, Suffolk).

GREAT SKUA NEAR SHREWSBURY.—A few months ago a tenant came to me, bringing alive in a sack a strange bird he had picked up, apparently quite exhausted, but not hurt, in one of his turnip-fields. It turned out to be the Great Brown Skua, which Mr. Henry Shaw tells me he has never seen alive in Shropshire in his time, and is very rare in any part of Great Britain. It is now quite well in my aviary, and apparently does not in the least object to company or confinement.—R. CHOLMONDELEY (Shrewsbury).

REEVE IN DORSETSHIRE IN DECEMBER.—A Reeve was caught in a snipe-trap in December last, in a water-meadow at Meltown St. Andrew's. I have another in my possession, which was shot within a mile of this spot, about ten years ago.—J. C. MANSEL-PLEYDELL (Whatcombe, Dorsetshire).

ESQUIMAUX CURLEW IN ABERDEENSHIRE.—At a meeting of the Natural History Society of Glasgow, held on the 26th November last, Mr. J. A. Harvie Brown exhibited a specimen of the Esquimaux Curlew, *Numenius borealis*, which had been shot in Aberdeenshire on the 29th of the previous month of September. A note to Mr. Robert Mason, the Secretary of the Society, procured for me the following particulars from Mr. Sim, the taxidermist, of King Street, Aberdeen, to whom the specimen was sent for preservation:—"The bird was shot by Mr. Ramsay, of Staines, and proved to be a male, weighing eight ounces. The total length from tip of bill to end of tail was $13\frac{1}{2}$ inches; expanse of wings $25\frac{3}{4}$ inches; bill 2 inches, wing from carpal joint $7\frac{7}{8}$ inches, and tarsus $1\frac{3}{4}$ inch. The stomach contained crowberries, some flies, and a caterpillar." This rare straggler from America was first noticed as a visitor to the British Islands in 1855, when one was killed in Kincardineshire, as recorded by Mr. Longmuir ('Naturalist,' 1855, p. 265), and subsequently in Yarrell's 'History of British Birds' (3rd ed., vol. ii., p. 620). Two were subsequently shot in Suffolk, as noticed by Mr. Hele in his 'Notes about Aldeburgh' (p. 177), and a fourth, purchased in Dublin in the flesh, in October, 1870, is preserved in the collection of Sir Victor Brooke (see 'Zoologist,' 1870, p. 2408). The specimen now referred to therefore makes the fifth which has been procured in this country.—J. E. HARTING.

GROUSE QUITTING THE MOORS IN YORKSHIRE.—A pair of Grouse were seen in a turnip-field on our farm early in February. This is the only instance of the kind that has occurred for a very long period, and seems to indicate an absence of food in their usual haunts. We are ten miles from the nearest grouse moor.—WALTER STAMPER (Highfield House, Oswaldkirk, York).

WRENS ROOSTING.—Noticing one evening several Wrens coming to roost in the ivy during the excessive cold of this winter, I went towards dusk to the spot, and there in a hole in some honeysuckle and ivy stems I found no less than fourteen of these little birds congregated together, no doubt for the purpose of keeping each other warm.—HENRY G. TOMLINSON (The Woodlands, Burton-on-Trent).

CURIOUS HAUNT FOR A SNIPE.—On the 24th December last a carpenter, in the village of Killashandra, on entering an old uninhabited house used occasionally by him as a workshop, was surprised to see a Snipe flying about. It was found to be rather thin, evidently having taken up its quarters there owing to the severity of the weather.—W. J. HAMILTON (Castle Hamilton, Co. Cavan).

GLAUCOUS GULL AT ALDEBURGH.—A fine specimen of the Glaucous Gull was brought to me on January 25th. It was shot at Thorpe Mere, where it was feeding in company with a flock of Common Gulls.—F. M. OGILVIE (Sizewell, Leiston).

HAWFINCH IN IRELAND.—On the 13th November a specimen of the Hawfinch (*Coccothraustes vulgaris*) was brought to me. It was found lying dead on one of the garden walks near a lime tree. It was a young male, in good condition, and the plumage perfect.—W. J. HAMILTON (Castle Hamilton, Co. Cavan).

[The Hawfinch is included by Thompson amongst the birds of Ireland as an occasional visitant.—ED.]

GREAT GREY SHRIKE IN YORKSHIRE.—On the 11th January last, whilst standing upon the platform at Shipley Station, my brother and I observed what we had little doubt was a Grey Shrike fly over the metals to the south of the Station. This is the second occurrence in this part within the last few years. The first example was shot in the Goitstock Valley, and is now in the possession of Mr. P. Dalton, Bingley. On the 1st February last I saw a Mealy Redpoll, in company with Lesser Redpolls and Siskins, feeding upon the seeds of the alder by the side of the River Aire. Of course there might have been more than one specimen, but I did not get near enough to identify any more with certainty.—E. P. BUTTERFIELD (Wilsden).

CLOSE-TIME FOR FRESH-WATER FISH.—In the month of August, 1878, an Act was passed having for its object the appointment of a close-time for such fresh-water fish as were not already protected by previous Statutes. This Act, which is entitled 'The Freshwater Fisheries Act, 1878,' will come into operation for the first time during the present spring, and its principal provisions are as follows:—The close-time appointed is *between the 15th day of March and the 15th day of June, both inclusive*. The term "fresh-water fish" includes all kinds of fish (other than Pollan, Trout and Char) which live in fresh water, except those kinds which migrate to or from the open sea. If any person during this close season fishes for, catches, or attempts to catch or kill any fresh-water fish in any river, lake, tributary, stream, or other water connected or communicating with such river, he shall, on summary conviction before two justices, be liable to a fine not exceeding forty shillings. This, however, does not apply (a) to the owner of any several or private fishery where Trout, Char or Grayling are specially preserved, destroying within such fishery any fresh-water fish other than grayling; (b) to any person angling in any several fishery with the leave of the owner of such fishery, or in any public fishery under the jurisdiction of a board of conservators with the leave of the said board; (c) to any person taking fresh-water fish for scientific purposes; (d) to any person taking fresh-water fish for bait. Buying, selling, or exposing for sale fresh-water fish during the close season is declared illegal under a penalty not exceeding, for a first offence, 40s., and for a second offence, £5:

the person or persons convicted forfeiting all fish caught, bought, sold or exposed for sale, and (at the discretion of the convicting justices) all instruments used in the taking of such fish; the justices having the power also, upon information on oath, to authorise the search of any suspected premises. Sundry clauses which by the Salmon Acts render certain modes of fishing illegal, are introduced, as well as regulations relative to licenses, water-bailiffs, &c. The counties of Norfolk and Suffolk, which are already protected by a Freshwater Fisheries Act, are exempted from the operation of certain clauses in the present one.—ED.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 6, 1879.—Prof. ALLMAN, F.R.S., President, in the chair.

Several interesting exhibitions and remarks, chiefly on vegetable products, were made, the only one of zoological interest being that of Mr. R. Irwin Lynch, namely, parts of the bull's-thorn acacia and imbauba tree, as also a couple of orchids, all exemplifying the economy of those plants in affording protection to and food for ants.

A short paper, "On the position of the Genus *Sequenzia* among the Gasteropoda," was read by Dr. Gwyn Jeffreys. Herein he expressed an opinion differing from that lately promulgated by the Rev. R. Boog Watson, believing that this mollusk belongs to the Solarium group rather than to the Trochus family, in which the latter naturalist had placed it.

Sir John Lubbock then read two papers "On Ants." The first was devoted to an account of their anatomy, the muscular system being more particularly described, as elucidated by microscopical sections, &c., these being accompanied by an extensive series of drawings. The second paper was a continuation of his observations "On the Habits of Ants." He observed that he had at first isolated his nests by means of water. This was effectual enough, but, especially in summer, the water required to be continually renewed. Kerner, however, had suggested that the hairs of plants served to prevent ants from obtaining access to the honey, and it accordingly occurred to him that strips of fur arranged with the points of the hairs downwards might answer his purpose. He had tried this, and, finding it successful, he thought a similar arrangement might perhaps be found useful in hot countries. It is generally stated that the queen ants alone lay eggs, but Sir John has found that in most of his nests some few of the workers are capable of doing so. It appears, however, that these eggs always produce males. In the case of bees we know that the queen is fed on a special kind of food. In ants it is not feasible to make observations

similar to those by which in bees this has been established. It is, however, rendered more than probable by the fact that, while males and workers have been bred by hundreds in his nests, no queen has yet been produced. M. Lespès has given a short but interesting account of some experiments made by him on the relations existing between ants and their domestic animals, from which it might be inferred that even within the limits of a single species some communities are more advanced than others. He found that specimens of the curious blind beetle, *Claviger*, which always occurs with ants, when transferred from a nest of *Lasius niger* to another which kept none of these domestic beetles, were invariably attacked and eaten. From this he infers that the intelligence necessary to keep *Clavigers* is not co-extensive with the species, but belongs only to certain communities and races, which, so to say, are more advanced in civilization than the rest of the species. Sir John Lubbock, however, removed specimens of the curious blind *Platyarthus* from one nest to another, but they were always amicably received. He even transferred specimens from a nest of *Lasius flavus* to one of *Formica fusca*, with the same result. As regards the longevity of ants, he has now two queens of *F. fusca* which seem quite in good health, and which have lived with him since 1874; they are, therefore, probably five years old. He has also workers of *L. niger*, *F. sanguinea*, *F. fusca* and *F. cinerea*, which he has had under observation since 1875. In his previous papers he has given several instances which seem to show that ants do not exhibit such unvarying kindness to their friends as has been usually supposed. He wished, however, to guard himself against being supposed to question the general good qualities of his favourites. In fact, ants of the same nest never quarrel among themselves; he had never seen any evidence of ill-temper in any of his nests. All is harmony. He had already in previous papers given various instances of tender kindness. Again, in one of his nests of *Formica fusca* was a poor ant which had come into the world without antennæ. Never having previously met with such a case, he watched her with great interest, but she never appeared to leave the nest. At length, one day he found her wandering about in an aimless sort of manner, and apparently not knowing her way at all. After a while she fell in with some specimens of *Lasius flavus*, who directly attacked her. He then set himself to separate them; but she was evidently much wounded, and lay helpless on the ground. After some time another *F. fusca* from her nest came by. She examined the poor sufferer carefully, then picked her up tenderly and carried her away into the nest. It would have been difficult, Sir John thinks, for any one who witnessed this scene to have denied to this ant the possession of human feelings. It is clear, from the experiments recorded in the present and in Sir John's former papers, that the ants recognise all their fellows in the same nest, but it is very difficult to understand how this can be effected. The nests vary very much in size,

but in some species 100,000 individuals may probably be by no means an unusual number, and in some instances even this is largely exceeded. Now, it seems almost incredible that in such cases every ant knows every other one by sight; neither does it seem possible that all the ants in each nest should be characterized from those of other nests by any peculiarity. It has been suggested in the case of bees that each nest might have some sign or pass-word. The whole subject is full of difficulty. It occurred to Sir John, however, that experiments with pupæ might throw some light on the subject. Although the ants of every nest, say of *Formica fusca*, are deadly enemies to others, still if larvæ or pupæ from one nest are transferred to another they are kindly received, and tended with, apparently, as much care as if they really belonged to the nest. In ant warfare, though sex is no protection, the young are spared—at least, when they belong to the same species. Moreover, though the habits and dispositions of ants are greatly changed if they are taken away from their nest and kept in solitary confinement or only with a few friends, still in such circumstances they will carefully tend any young which may be confided to them. Now, if the recognition were effected by means of some signal or pass-word, then, as it can hardly be supposed that the larvæ or pupæ would be sufficiently intelligent to appreciate, still less to remember it, the pupæ which were entrusted to ants from another's nest would have the pass-word, if any, of that nest, and not of the one from which they had been taken. Hence, if the recognition were effected by some pass-word or sign with the antennæ, they would be amicably received in the nest from which their nurses had been taken, but not in their own. He therefore took a number of pupæ out of some of his nests of *Formica fusca* and *Lasius niger* and put them in small glasses, some with ants from their own nest, some with ants from another nest of the same species. The results were that thirty-two ants belonging to *F. fusca* and *L. niger*, removed from their nest as pupæ, attended by friends and restored to their own nest, were all amicably received. What is still more remarkable, of twenty-two ants belonging to *F. fusca*, removed as pupæ, attended by strangers, and returned to their own nest, twenty were amicably received. As regards one, Sir John was doubtful; this last was crippled in coming out of the pupa-case, and to this perhaps her unfriendly reception may have been due. Of the same number of *L. niger*, developed in the same manner, from pupæ tended by strangers belonging to the same species, and then returned into their own nest, seventeen were amicably received, three were attacked; about two Sir John felt doubtful. On the other hand, fifteen specimens belonging to the same two species, removed as pupæ, tended by strangers belonging to the same species, and then put into the strangers' nest, were all attacked. The results may be summarised as follows:—Pupæ brought up by friends and replaced in their own nest—attacked, 0; received amicably, 33. Pupæ brought up by

strangers and put in own nest—attacked, 7 (about three of these Sir John did not feel sure); received amicably, 37. Pupæ brought up by strangers and put in strangers' nest—attacked, 15; received amicably, 0. Sir John intends to make further experiments in this direction, but the above results seem very interesting. They appear to indicate that ants of the same nest do not recognise one another by any pass-word. On the other hand, if ants are removed from a nest in the pupæ state, tended by strangers, and then restored, some at least of their own relatives are certainly puzzled, and in many cases doubt their claim to consanguinity. Strangers under similar circumstances would be immediately attacked. These ants, on the contrary, were in every case—sometimes, however, after examination—amicably received by the majority of the colony, and it was often several hours before they came across one who did not recognise them.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

February 4, 1879.—Dr. GÜNTHER, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January, 1879, and called special attention to a Bar-winged Rail, *Rallina paciloptera* (Hartlaub), from the Fiji Islands, acquired by purchase; and to a young male Giraffe, *Camelopardalis giraffa*, received on deposit.

Mr. Selater exhibited and made remarks on a specimen of a Curassow, belonging to the Royal Museum of Copenhagen, which he had received from Prof. J. Reinhardt for examination, and which Prof. Reinhardt had proposed to refer to a new species, *Mitua Salvini*.

Mr. R. Bowdler Sharpe exhibited a series of Bulwer's Pheasant, *Lobiophasis Bulweri*, from the Lawas River, N.W. Borneo, collected by Mr. W. H. Treacher, Acting Governor of Labuan. The series represented every stage of plumage of this Pheasant, and conclusively proved that *L. castaneicaudatus*, Sharpe, was the immature male of *L. Bulweri*.

A communication was read from Prof. A. H. Garrod, containing some notes on certain points in the anatomy of the Hoatzin, *Opisthocomus cristatus*.

Mr. Selater read some notes on the breeding of the Argus Pheasant and other *Phasianidæ* in the Society's Gardens.

A communication was read from the Rev. O. P. Cambridge, containing the description of a new genus and species of Spiders, proposed to be called *Fritzia Muelleri*.

Mr. W. Ottley read the first part of a series of observations on the structure of the eye-muscles in the Mammalia.

A communication was read from Mr. Osbert Salvin on some birds

transmitted by the Rev. Thomas Powell from the Samoan Islands, amongst which were two new species proposed to be called *Pinarolestes Powelli* and *Fregetta mæstissima*.

A communication was read from Mr. W. H. Dall, containing remarks on the use of the generic name *Gouldia* in Zoology.

Mr. George A. Shaw read notes upon the habits of four species of Lemurs, specimens of which had been brought alive to England, in 1878, from the province of Betsileo, in Central Madagascar.

A communication was read from Mr. F. Moore, containing descriptions of some new Asiatic Diurnal Lepidoptera.

Dr. A. Günther pointed out the characters of a new Rodent from Medellin, U.S. of Columbia, for which the name *Thrinacodus albicauda* was proposed.

February 18, 1879.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary exhibited, on behalf of the Rev. T. O. Morris, an example of *Bombyx quercus* with malformed antennæ.

Mr. Sclater exhibited a new Humming Bird from Northern Peru, which he had received for identification from M. L. Taczanowski, and which he proposed to name *Thaumatius Taczanowskii*.

Mr. Sclater exhibited a living Amphisbænian (*Bronia brasiliiana*), lately received by the Society from Monte Video.

A communication was read from Mr. E. L. Layard, containing a note on *Pachycephala icteroides*, Peale, with the description of a supposed new species of the genus from Ovalau, Fiji group, proposed to be called *P. neglecta*.

A communication was read from Dr. A. Günther, containing a description of four new species of Chameleons from Madagascar, proposed to be called *C. malphe*, *C. brevicornis*, *C. gularis* and *C. globifer*.

A communication was read from Mr. Edgar A. Smith, containing a description of a large collection of Mollusca from Japan, formed by Captain H. C. St. John, R.N., of H.M.S. 'Sylvia.'

Messrs. Godman and Salvin read descriptions of a number of new species of butterflies from Central and South America. A second communication from the same authors gave an account of a collection of butterflies, made by the Rev. G. Brown in New Ireland and New Britain; and Mr. A. G. Butler gave an account of the Heterocera contained in a collection from the same locality.

A communication was read from Mr. W. A. Forbes on the systematic position of the genus *Lathamus*, in which, from a study of its pterylosis, osteology, and other points in its external and internal structure, he showed that this Parrot must be referred to the neighbourhood of the *Platycercidæ*.

Mr. R. Bowdler Sharpe read a note on *Heliodilus Soumagnei*, Gradidier, of which a specimen had recently been acquired by the British Museum. Mr. Sharpe likewise pointed out the characters of a second species of the genus *Dromæocercus*, from Madagascar, proposed to be called *D. Seebohmi*.

A communication was read from Mr. A. Boucard, containing descriptions of two supposed new species of South American birds.

Dr. F. Day read some remarks on the occurrence at Southend of the Little Gurnard, *Trigla paciloptera*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

February 5, 1879.—Sir JOHN LUBBOCK, Bart., M.P., V.-P.R.S., &c., President, in the chair.

Mr. H. J. Elwes exhibited a collection of Lepidoptera from a small island at the mouth of the Amoor River, in Siberia.

Mr. C. O. Waterhouse exhibited a specimen of *Gasteracantha Cambridgei*, a remarkable spider from West Africa, recently described by Mr. A. G. Butler.

Mr. G. C. Champion exhibited a specimen of *Harpalus oblongiusculus*, taken by Mr. J. T. Harris, in May last, at the Chesil Bank, Weymouth.

The Secretary read a note from Mr. A. H. Swinton, calling attention to a passage in a paper by Mr. Wood-Mason, published in the last part of the Society's 'Transactions' (part iv., p. 265), wherein the author asks, "How is it that nobody has ever heard the *Mantidæ* stridulate?" Mr. Swinton referred to Kirby and Spence's 'Introduction to Entomology' (7th ed., p. 493), where it is stated, on the authority of M. Goureau, that *Mantis religiosa*, "when alarmed and having put itself in an attitude of defence, rubs the sides of the abdomen against the interior borders of the wings and elytra, so as to produce a noise like that of parchment rubbed together."

The Rev. A. E. Eaton remarked, *apropos* of the homologies of wing-nervures (see Proc. Ent. Soc., 1878, p. lvi.), that in the anterior wings of most of the *Ephemeridæ*, three primary groups of longitudinal nervures could be distinguished, the foremost proceeding directly from the thorax; the hindermost issuing from, or terminating in, a curved or angulated prominent fold interjacent between the first group and the hinder part of the base of the wing close to the wing-root; and an intermediate group which does not attain to the thorax, but either terminates in the wing-membrane close to the base of the wing, or is annexed to the hinder veins of the first group. The equivalents of the intermediate group in their ultimate ramifications constitute the "apical forks" of Mr. McLachlan's system. Mr. Eaton exhibited drawings of wings of Trichoptera and Tineina, in which the three groups of nervures were distinguished by colour,

and the "apical forks" were shaded and numbered, in correspondence with their homologies.

Mr. Meldola communicated the following note on a remarkable case of mimicry observed by Dr. Fritz Müller:—"I have just reared from the caterpillar state ten specimens (being five males and five females) of *Eueides pavana*. This is one of our rarest butterflies, and I think I have not yet caught more than half-a-dozen, all of which were females. These resemble *Acræa Thalia* so closely that before they are caught they can be distinguished only by the club of the antennæ being yellow, while it is black in *Acræa*. Now in the male of *Eueides pavana* the club of the antennæ is black also, and this has no doubt been the cause of my never catching any male. I know of no other case in which the males of a mimicking butterfly resemble more closely the mimicked one than the females do, while the inverse is well known to be of rather frequent occurrence."

Mr. A. G. Butler communicated a paper "On the Lepidoptera of the Amazons collected by Dr. James W. H. Trail during the years 1873 to 1875. Part iii., Noctuites."

Mr. C. O. Waterhouse communicated a "Description of a new Genus and Species of Rhyncophorous Coleoptera allied to *Sipalus* found in an Orchid-house."

Mr. F. Moore communicated "Descriptions of the Species of the Lepidopterous Genus *Kallima*."

Part iv. of the 'Transactions' for 1878 was on the table; as were also copies of the President's Anniversary Address delivered at the last Meeting, for distribution.—R. MELDOLA, *Hon. Secretary*.

NOTICES OF NEW BOOKS:

Wanderings in South America. By CHARLES WATERTON. New Edition, with Biographical Introduction and Explanatory Index, by the Rev. J. G. Wood. With one hundred illustrations. London: Macmillan & Co. 1879.

So many years have elapsed since the last edition of this very entertaining book was published, and second-hand copies have become so difficult to procure, that the appearance of the handsome new edition just issued by Messrs. Macmillan is as well-timed as it is welcome. If the illustrations which it contains are not invariably accurate, we must at least admit that as regards type and paper the volume is in every way worthy of the subject matter of the work, and of the well-known house from

which it emanates. Whether or not a more competent editor than the Rev. J. G. Wood might have been found we will not say; at all events, it does not appear that Mr. Wood has ever visited the countries in which the author of the 'Wanderings' so long sojourned, nor can he, as his editorial notes sufficiently testify, have made more than a very superficial study of the South American fauna and flora. To say that he has exercised a very wise discretion in leaving the 'Wanderings' "untouched as Waterton wrote them," keeping his own notes quite distinct in an "Explanatory Index," is perhaps the highest compliment we can pay him. We certainly cannot congratulate him in every case upon the success of his identification of the species which Waterton described by their native names, although, as he tells us in his Preface, he has had the assistance, as regards the birds mentioned, of the Secretary of the Zoological Society. From what we know of Mr. Selater's valuable publications on the subject of South American Ornithology, we feel sure that had Mr. Wood consulted him a little oftener he would have done so with advantage, and would have been enabled to avoid many of the errors into which he has fallen. A naturalist who has not made any special study of South American animals might be excused if he failed occasionally to identify with certainty from Waterton's description the species of a genus containing several closely-allied forms; but we hardly expected to find Mr. Wood committing so great a blunder as to discover in Guiana and Demerara Old-World species like *Pelecanus onocrotalus* (p. 451) and *Platalea leucorodia* (p. 742), which, in the New World are quite unknown; while he evinces so little knowledge of the geographical distribution of animals as to assert that "only two species of Tapir survive—one in Tropical America, and the other in Malacca and Sumatra" (p. 474). We were under the impression that there are at least three distinct species of Tapir in South America alone, two of which may be seen at any time by visiting the Zoological Society's Gardens in the Regent's Park. And here we may remark that the editor of the 'Wanderings' would not have written irrelevantly if he had directed attention to the great utility and value of a menagerie like the one referred to, in making us acquainted with the external forms and relationships of the wild animals of our own and other countries. To give another illustration: The first native name employed

by Waterton which necessitates a reference to Mr. Wood's "Explanatory Index" is *Maroudi* (p. 17). On seeking an explanation we find, at p. 434, the statement that "there are several species of Maroudis, those which are best known being the Common Maroudi (*Penelope cristata*) and the Whiteheaded Maroudi (*Penelope pipile*).” We venture to think that it would have been much more to the purpose had Mr. Wood stated that the Maroudis are more familiarly known under the name "Guan," that they are closely related to the Curassows, and that several species of both may be seen any day in the Zoological Society's aviaries.

We do not know from what source Mr. Wood has borrowed his nomenclature, but the scientific names which he employs certainly do not represent the views of the best authorities at the present day, or we should not find the generic names *Brachyurus*, instead of *Pithecia*, for the Bisa Monkey (p. 374); *Arapunga*, instead of *Chasmorhynchus*, for the Bell Bird (p. 380); and *Uropsophus*, instead of *Crotalus*, for the familiar Rattlesnake (p. 465).

It does not seem to have occurred to the editor of the 'Wanderings' that in the 'Proceedings of the Zoological Society,' and in 'The Ibis,' he might have found numerous valuable papers on South American Ornithology which would have materially assisted him in his labours, while Messrs. Sclater and Salvin's "Nomenclator Avium Neotropicalium" would have furnished him with the correct names of the species identified. We will mention one article out of many which, in our opinion, ought not to have been overlooked, namely, that by Mr. Osbert Salvin "On the Costa Rican Bell Bird and its Allies" ('Ibis,' 1865, p. 90), while on the same subject he might have consulted with advantage Mr. E. C. Taylor's remarks ('Ibis,' 1864, p. 88), and those of Mr. Sclater in the volume for 1866 of the same periodical (p. 406). A reference to these sources of information under the head of "Campanero," (p. 180) would have been both appropriate and useful.

It should not be forgotten that the observations recorded by Waterton were made by him between the years 1812 and 1824, and therefore to attempt, in 1879, to elucidate his remarks without any reference to the labours and publications of the well-known writers on South American Zoology who have come

after him, is to exhibit a carelessness which, in so practised a writer as Mr. Wood, is inexcusable.

We regret to have thus to express our disappointment in the result of his labours in the present instance, but, while we are grateful to the publishers for having placed in our hands so elegant a text of a truly delightful book, candour compels us to express the opinion that the natural history portion of Waterton's 'Wanderings' has yet to receive a more adequate and useful treatment than that which it has met with at the hands of Mr. Wood.

Sketches of the Wild Sports and Natural History of the Highlands.

By CHARLES ST. JOHN. A new Edition. London: John Murray. 1878. Crown 8vo.

FEW of our readers, we imagine, are unacquainted with the writings of the late Charles St. John, who, combining the tastes of a sportsman with the acquirements of an observant naturalist, has bequeathed to posterity some of the most instructive and agreeably written essays on Sport and Natural History ever published in the English language.

Apart from the pleasant unaffected style in which his experiences are detailed, one great charm about his books is that they contain no statement for the truth of which he was not personally able to vouch. "I have been particularly careful," he says, "to describe and note down nothing, the authenticity of which I am not certain of. I have carefully avoided the great error of taking things on hearsay. In the very few instances in which I have been obliged to depend on the eyes of others, I have been careful to guard against being knowingly or unknowingly deceived. A book of this sort should be a book of reference, and as such to be thoroughly depended on; and I can assure my readers that they may fully depend on the truth and correctness of everything here mentioned."

These remarks occur in the preface to the author's "Natural History and Sport in Moray," and show very clearly his views of the duty of a naturalist. They apply with equal justice to the book before us.

Those who are familiar with the earlier edition of this work, which appeared some twenty years ago in a smaller and less

important form, will welcome the appearance of this new edition, which, from its size and the beauty of the illustrations and type, forms a more fitting memorial of the deceased naturalist than has yet been produced.

As regards the illustrations, great pains seem to have been taken to enter into the spirit, and, where possible, to depict the actual scene of the events described in the text. We may particularly notice "Fishing by Moonlight" (p. 8), "Rapids on the Findhorn" (p. 74), "Across Cromarty Bay" (p. 148), "Dulsie Bridge" (p. 221), and "Swans in the Bay" (p. 235). The portrait of the Wild Cat at page 44 cannot be commended, being unfortunately not in the least like one, and we speak advisedly, having before us, as we write, a well preserved specimen of this animal which was shot on the north side of Loch Ness. The Roebuck on page 21 would look much more natural if it were not so white; for although an albino Roe is not absolutely unknown, it is sufficiently rare to preclude its being figured as an ordinary variety of this graceful animal. If we are not mistaken a white Roe, shot near Luss, on Loch Lomond, is preserved in the collection of Sir James Colquhoun.

The Long-eared Owl (p. 75) and the Kestrels (p. 112) strike us as being very delicately and naturally drawn, although we must demur to the dark cheek-patch on the Kestrel, which causes it to look too much like a Peregrine. But we are not disposed to criticise too closely a production upon which such evident pains have been bestowed both by artist and engraver. Of the letterpress we cannot speak too highly. Sportsmen and naturalists have alike tested its merits by the light of their own experience, and although few perhaps have enjoyed such opportunities for studying Nature amid some of the wildest scenery as Charles St. John, those who may peruse his writings cannot fail to perceive the extreme accuracy of his observations, and the charm of a style which always instructs while it never wearies.

Shooting Adventures, Canine Lore and Sea-fishing Trip. By
"WILDFOWLER." London: Chapman & Hall. 1879.
2 vols. 8vo.

THOSE of our readers who have perused the two former volumes by "Wildfowler" will have discovered that he is no stay-

at-home sportsman who draws upon his imagination for a theme to dwell upon. He is never happy unless wandering in search of sport, be it with gun, rod, or deep-sea line, not only in this our "sea-girt isle," but in any part of the European continent which may seem to promise occupation to an enthusiastic gunner and fisherman. The two volumes before us may be described as "a third series" of his former works,* for although the title has been slightly, and, as we think, unnecessarily, altered in each series, the scope and plan of the book are much the same, and the 'Adventures' here narrated do not differ in kind from the 'Trips' with which he has on former occasions made us acquainted.

To say that there is much novelty in the subjects dealt with would be misleading, for those of our readers who delight in shooting and fishing will find in many of the chapters merely an echo of their own experience, and little is related which might not happen, and no doubt has happened frequently, to most sportsmen. We must admit, however, that in some of the chapters we find exceptions to this; such for instance as "Peculiar Duck Shooting on the River Saone" and "Netting Black Ducks at Cape Grisnez." In the former of these two chapters the author describes a mode of shooting wild ducks at night, which he saw practised in France, where the birds were approached in a *bachot*, or large flat-bottomed punt, painted black, and with sides which "rose about a yard above the stream" to conceal the guns. A pot of congealed grease, with a handful of tow stuck in it for a wick, is placed in a copper-pan and rigged to the end of a bowsprit about ten feet long; a reflector being placed between the light and the boat, by which means the light is projected forward, and the gunners behind remain in comparative darkness. The light appears to exercise an extraordinary fascination over the fowl, which, instead of taking to their wings in alarm, swim towards the boat with every sign of curiosity, and pay the penalty as soon as they are within range. This can scarcely be called a sportsman-like practice; and, beyond the novelty which it presents to those who witness it for the first time, has nothing to recommend it to any save those who, being dependent on their guns for a living, are

* A notice of the "Second Series" appeared in 'The Zoologist,' 1878, p. 145.

not particular how they proceed so long as the fowl are secured for the market. Hardly less objectionable is the mode of netting black ducks (Scoters and Scaups) which is said to be employed by the fishermen at Cape Grisnez ; although, as in the former case, it has a certain amount of attraction for those who see it practised for the first time. It consists in driving into the sands at low-water a number of stakes enclosing a pretty large parallelogram of ground covered as much as possible with mussels and other shell-fish. To the tops of these stakes a net is fixed in such a manner as to have its flat surface parallel with and about two feet from the bottom. At high-tide this net is covered, and the black ducks, which come shoreward for the shallower water where they can reach food, on diving down for it, became entangled in the meshes of the net and are drowned. A longer and narrower net set up edgewise, as for fish, and forming a sort of semicircle beyond the flat net, prevents any dead birds that may be washed off the flat net by the action of the tide from floating out to sea. In this manner a score of ducks have been taken at a time. The device, however, is not a new one. The late Mr. Lloyd, in his 'Game-birds and Wild-fowl of Sweden and Norway' (pp. 367, 368), describes a somewhat similar mode of netting wildfowl ; and Mr. J. H. Gurney, Jun., in his 'Rambles of a Naturalist,' has a chapter entitled "Netting Sea-birds on the Wash." Many of our readers will no doubt recollect also Mr. Stevenson's remarks on this subject in the second volume of his 'Birds of Norfolk' (pp. 376, 377).

Perhaps the most extraordinary capture of wild ducks in a net is that related by Daniel in the Supplement to his 'Rural Sports' (p. 627). A fisherman near Drumburgh placed a flounder-net in the river Eden, which is subject to the flux and reflux of the tide, and on his returning to take up his net, instead of finding fish, he found it loaded with wild ducks. During his absence a "fleet" of these birds had alighted below the net, and, on the flowing of the tide, were carried, from the contraction of the channel, with great impetuosity into the net and drowned. He caught one hundred and seventy Golden-eyes !

Amongst other chapters in the present volumes, which we doubt not will possess an interest for many readers, may be mentioned—"Twirling for Larks on the Continent," and "Boar and Wolf-hunting in France." It would not be easy, however, to

find a better account of Wolf-hunting in France than that which is given by Col. Thornton in his 'Sporting Tour in France,' a work with which "Wildfowler" ought to make himself acquainted.* Of his own book we have probably said enough to convince those of similar tastes that they will find a good deal to amuse them in these reminiscences of our enthusiastic sportsman.

English Folk-Lore. By the Rev. T. F. THISELTON DYER, M.A.,
London: Hardwicke & Bogue. 1878. Post 8vo.

ACTUATED apparently by the impulse which, a year ago, prompted the formation of an English Folk-Lore Society, Mr. Dyer has sent forth the pleasantly-written little volume before us. We are candidly told in the Preface that it is not intended to be exhaustive, but has been written with a view of giving the reader information in a popular form about some of those superstitions that still linger on here and there throughout the country. There is no doubt that considerably more might be written on the subject, and has been written in scattered volumes, than is contained in the present work, but we are none the less grateful for the instalment here presented to us.

The chapters with which we are chiefly concerned are those on Birds (chap. iii.), Animals (chap. iv.), and Insects and Reptiles (chap. v.). Birds are in most countries the subject of a very varied folk-lore, and the superstitious and credulous have generally discovered in their movements omens and prognostications of coming events. It is often extremely difficult to trace superstition of any kind to their source; but those connected with birds, like all others, no doubt have frequently originated in isolated occurrences. Thus, in ancient times, if a certain bird was seen to fly over a city just before a calamity of any kind, it was ever after regarded as a bird of ill-omen and shunned as such.

Amongst the birds noticed by Mr. Dyer the Cuckoo receives the most attention, and many popular legends concerning it are given. Most of these are well known, and need not be quoted here. We may remark, however, that Mr. Dyer does not always

* 'A Sporting Tour through various parts of France in the year 1802: including a Concise Description of the Sporting Establishments, Mode of Hunting and other field-amusements as practised in that country.' 2 vols. 4to. 1806.

give the best version of the rhymes quoted by him: a single instance will suffice. We give Mr. Dyer's lines first, and append the better known version:—

In April	In April
The Cuckoo shows his bill;	Come he will;
In May	In May
He is singing all day;	He sings all day;
In June	In June
He changes his tune;	He changes his tune;
In July	In July
He prepares to fly;	He prepares to fly;
In August	In August
Fly he must	Go he must.

The lines to the Nightingale (p. 72) beginning

“ Every thing did banish moan
Save the Nightingale alone,”

and referring to the popular notion that the mournful notes of this bird are produced by its leaning against a thorn while it sings, although attributed by Mr. Dyer, like others before him, to Shakespeare, and included in most editions of his poems, were written, it is believed, by Richard Barnefield, in 1598, and published by him in a work entitled ‘Poems in divers Humours.’*

When quoting Andrew Boord to the effect that “in the Forest of St. Leonards in Southsex there doth never singe nightingale;” that “they wyl singe round about the Foreste and never within the precincte of the Forest,” Mr. Dyer might have referred also to “that lake whose gloomy shore Skylark never warbles o’er,” *i.e.*, Glendalough in the County Wicklow. There are many such legends in which the absence of certain animals from particular localities or districts is insisted on, but the experience of naturalists has shown that such statements, however time-honoured they may be, are not always to be relied on. Mr. Dyer has collected some curious superstitions and odd notions concerning animals, chiefly in connection with weather-prophecy, death-omens, and the ill-luck said to attend the killing them, but he has by no means exhausted all that might be said on what may be termed “the Folk-lore of Zoology.” Under this title some years ago, Mr. E. R. Alston contributed a

* See Ellis’s ‘Specimens of the Early English Poets,’ vol. ii., p. 356.

series of articles to this Journal,* to which Mr. Dyer would have done well to refer, since they contain much that, in a collection like the present, might have been appropriately quoted.

Moore's Columbarium, or the Pigeon House; being an Introduction to a Natural History of Tame Pigeons. London, 1735. 8vo. Reprinted by W. B. TEGETMEIER. 'The Field' Office, 346, Strand. 1879. 8vo.

THE 'Columbarium' of John Moore, the first English work on the varieties of domestic Pigeon, is so exceedingly scarce that it is doubtful whether more than one copy exists besides those in the Library of the British Museum. The work is of considerable interest to naturalists, as showing the exact condition of the varieties at the time of its publication, and the amount of alteration effected by careful selection for one hundred and fifty generations since.

Mr. Tegetmeier has just published a *verbatim et literatim* reprint, which he has prefaced with an introduction containing an interesting notice of Moore's other works, allusions made to him by Pope and other contemporary writers; and he shows the importance attached to the work by tracing three out of the four copies in the British Museum to the libraries of George III., Sir Joseph Banks, and Sir Hans Sloane.

It will be recollected that a few years ago Mr. Tegetmeier published a reprint of Boddaert's scarce 'Table des Planches Enluminées d'Histoire Naturelle,' only two copies of which were known to exist in this country; and we understand it is his intention to reproduce in the same way, from time to time, such other works as from their rarity and utility are of interest and value to naturalists, and yet at present are beyond their reach. Such a "series," we feel sure, cannot fail to prove acceptable to those who, while prosecuting their own researches in Zoology, set a proper value on the labours of worthy predecessors.

+ See 'Zoologist,' 1867, pp. 881, 921, 976, 1005; and 1868, pp. 1171, 1109.

CORRECTION OF ERROR.—In the review of 'The Fenland, Past and Present,' given in our last number, at p. 75, line 14, for "Swinesland" read "Swineshead."

THE ZOOLOGIST.

THIRD SERIES.

VOL. III.]

APRIL, 1879.

[No. 28.]

ORNITHOLOGICAL NOTES FROM NORFOLK FOR 1878.

BY HENRY STEVENSON, F.L.S.

THE weather at the commencement of the year was by no means favourable for either the sportsman or collector, the frosts in January, though severe at times, lasting but a day or two; the heavy snow storms, also, on the 24th and 25th were extremely local, and the ground was soon cleared, under the influence of a rapid change to a milder temperature with a considerable rainfall.

JANUARY.

Bittern.—Two Bitterns killed in the county between the 10th and 23rd were brought for sale to one of our Norwich bird-stuffers.

Shore Lark.—Three specimens, but all in indifferent plumage, were shot at Blakeney about the 28th.

Greenfinches, &c.—During the sharp frosts at the commencement of the month very large flocks of Greenfinches and Chaffinches, in both cases, apparently, all cock birds, frequented the fields in close vicinity to the city, and I have rarely seen more small birds exhibited in bunches for sale than appeared a few days later in some of our game-dealers' shops. There I remarked a large preponderance of hen Greenfinches, and I particularly noticed one large bunch of common House Sparrows, all cock birds, about two dozen of them. All these had been netted, and were in good condition.

FEBRUARY.

Lesser Redpoll.—During the mild damp weather at the beginning of the month very large numbers of this Redpoll frequented the fields near the city, feeding in flocks upon the ploughed lands and “layers.”

Goldeneye Duck.—Four fine males of this really “hard-weather” fowl were shown me on the 4th, all shot at Yarmouth in the sharp frost which prevailed during the last week in January.

Little Bustard.—A female bird of this species, now in the possession of Mr. H. M. Upcher, was shot at Potter Heigham on the 14th.

APRIL.

Curious Capture of a pair of Kestrels.—The Rev. Dr. Goodacre, of Wilby Rectory, in this county, informed Mr. Southwell that a pair of Kestrels which usually frequented the tower of the church were captured on the morning of the 1st of April (an ominous date for them), under the following singular circumstances:—When picked up in the churchyard both birds were found to have their wings frozen to their body-feathers, occasioned, I presume, by the drifting snow of the night before having penetrated into their roosting-place in the belfry, and so wetted their plumage that the sharp frost in the early morning fairly pinioned them, and on attempting to fly they fell to the foot of the tower, where they were secured and placed in a cage.

Supposed Golden Orioles.—The Rev. H. T. Frere, writing in June, informed me that a basket-maker at Diss had seen two birds in an osier carr at Palgrave (an adjacent village) which, from his description, were probably Golden Orioles. They flew up into an ash-tree as he entered the carr, were not at all wild, and their whistling notes resembled, he said, the tri-syllabic note with which Mr. Frere tried to imitate the whistle of an Oriole. He described them as “like a Mavis, only yellow.” They were still in the same place when he went back to the carr, about half an hour later, but were not seen after that date. This appears to have been about the end of April.

Savi's Warbler.—Mr. Frere also states that about the 27th of April, when walking with his wife near a small osier-bed in his neighbourhood, they recognized the note of this species, with

which they are both familiar, and after watching a few minutes they saw a bird flit along a ditch overgrown with thick herbage and settle within ten yards of them, where its Nightingale-like plumage, size, and form, confirmed their first impression. Though looked for several times after it was not seen again.

Lesser Spotted Woodpecker.—An adult male of this species was shot on the 5th, at Heydon, where a Great Spotted Woodpecker was also killed on the 23rd of March.

Sanderling.—An adult bird shot at Yarmouth on the 11th was still in full winter plumage, not a feather indicating the spring change of colour.

Singular Habit in a Blackbird.—A cock Blackbird which had a nest this month in my neighbour's garden, used constantly, whilst his mate was sitting, to perch on a projecting part of the stone parapet of the house, fronting the public road, and from thence pour forth his song, apparently as much at home in that novel situation as a Starling would be.

MAY.

Magpie.—About the first week in May a single Magpie was seen on a fence in the Earlham fields, within a mile of the city.

Waders killed in the "Close-time."—About the first week in this month two Avocets and a White Stork were sent up to Norwich from Yarmouth. An Avocet was seen about the same time (probably one of those killed), feeding by the margin of a brackish pool near the fishing-pier at Lowestoft, and on the 8th of June another was shot on Breydon.

Marsh Harrier.—This species, the very *genius loci*, in former days, as Richard Lubbock termed it, is not quite extinct in our "Broad district" as a resident. On the 9th of May, at Ranworth, one was seen by my informant to seize a duckling, about five weeks old, within a comparatively short distance of where he was standing, and no doubt, from the boldness of the swoop, the bird had a nest close by. The same bird, or its mate, was seen shortly before to carry off a Lapwing from a field in the same locality, where a labouring man was at work. Four eggs of this species were taken from a nest in that neighbourhood earlier in the season,

Ospreys.—An Osprey was shot at Gimingham, in this county, on the 2nd of May, and on the 13th an adult female, at the Hempstead ponds, near Holt. On the 19th another was seen in the same locality, and again on the 25th and 26th.

Little Woodpecker.—One shot near Diss about the last week in this month.

ARRIVAL AND DEPARTURE OF MIGRANTS AS OBSERVED CHIEFLY IN THE
VICINITY OF CROMER AND NORWICH.

April 3. Willow Warbler heard at Northrepps.

„ 6. Chiffchaff at Diddington.

„ 12. A large number of Hooded Crows departing from the coast about Northrepps. Wryneck at Keswick.

„ 13. Nightingale first heard at Thorpe, near Norwich, and generally in that neighbourhood on the 14th and 15th. One is said, on good authority, to have appeared in a favourite haunt near the city, on the 9th.

„ 14. Swallow seen near Norwich.

„ 16. One seen at Keswick. A Woodcock at Northrepps.

„ 17. Cuckoo at Sherringham. Said to have been heard near Norwich on the 12th.

„ 18. Blackcap at Northrepps.

„ 19. Two Red-backed Shrikes in Earlham fields, Norwich. I believe I saw these birds some few days before.

„ 20. Sand and House Martins at Keswick. Redstart first seen at Norwich; at Keswick on the 21st.

„ 23. Turtle Dove at Northrepps.

„ 30. Great Whitethroat at Northrepps.

May 9. Spotted Flycatcher at Northrepps; at Norwich a day or two earlier. Swift seen at Northrepps.

„ 11. Two Swifts seen at Norwich; and at Cromer Church on the 12th.

„ 15. A Nightjar flew past me about 8 P.M. on a public road within half a mile of the city; first seen at Northrepps on the 26th.

JUNE.

Osprey.—About the first week in this month an Osprey was shot from the moat surrounding the Hall at Hunstanton, near Lynn, not only an unusual locality for this wild species, but an unusual date for its appearance.

Spoonbills.—Three Spoonbills, all male birds, with fair crests and slight buffy tints on the neck, were killed at Yarmouth between the 1st and 11th of June.

AUGUST.

Migratory Waders.—A Turnstone, in full breeding plumage, was seen on the 5th by Mr. T. W. Cremer, at his pond at Beeston, and on the 9th he observed at the same spot a flock consisting of one Wood Sandpiper (*Totanus glareola*), five Green Sandpipers (*T. ochropus*), and from forty to fifty Common Sandpipers (*T. hypoleucus*). A female Greenshank, a bird of the year, was also shot at a pond at Rackheath, near Norwich, on the 10th.

Manx Shearwater.—On the 15th an adult male, very fat and exhausted, was picked up alive at Shottesham, quite an inland locality.

Tufted Duck.—A young female of this species, evidently a bird of the year, was shot on the river at Keswick, near Norwich, on the 17th August, and most probably, judging by the date, had been bred in this county.

Magpie.—A single bird seen at Northrepps on the 20th.

Nesting of Swallows and House Martins.—The cause of the diminished numbers of both these species, of late years, in many localities, has been a theme for speculation with various naturalists; but so far as our cities and small country towns are concerned,—and even villages of any extent and importance as to residents' houses,—one chief cause of disturbance, and even banishment, may undoubtedly be traced to the marked alteration in street architecture. I have been led to this conclusion by noticing in this quaint old city the great difference in the numbers of Swallows and Martins, during the breeding season, observed in its best thoroughfares and its less fashionable localities. Wherever the time-honoured wooden gables give place to the square roof and the iron gutter, the House Martin retires to less pretentious dwellings; and where—so generally the case now—chimney-pots take the place of the large open chimney-shaft, the Swallow deserts its long-accustomed haunts, or, as I remarked in several instances this year, builds under the eaves of the houses like the House Martin, fixing its nest close up to the brickwork, as it would to a cross-beam in a barn-roof or the rafters of a boat-house. I should scarcely have noticed that these were

Swallows' and not Martins' nests had I not seen the old birds hovering up under the eaves, and feeding their young as they appeared at the tiny aperture.

NOVEMBER.

Little Auks.—Several of these birds were picked up in inland localities during the first week in the month, the wind, at times, being strong from the N. and N.E. Between the 5th and 7th a birdstuffer at Holt had six from neighbouring localities, picked up dead or exhausted close to the coast; and far inland, about the same time, one was picked up at Hevingham, and another at Syderstone on the 2nd. There is also a record in 'The Field' of November 23rd of a Little Auk picked up alive near Norwich on the 9th, but which died soon after.

Waxwings.—A flock of five or six Waxwings are said to have been seen at Southwold, near Lowestoft, on the 9th of this month, and though appearing in the sister county of Suffolk, I record the fact here, as I learn from Mr. Anthony Hamond, of Westacre, that he has reason to believe some Waxwings occurred in his neighbourhood, in West Norfolk; but I have seen no specimens in our birdstuffers' hands.

Long-tailed Duck.—Mr. Cremer, of Beeston, had a young bird of this species killed on that part of the coast, about the 26th, and heard of others seen. A female was sent to Norwich Market about the 5th of November.

Black-headed Bunting, variety.—A curiously pied specimen of this bird was shot somewhere in the county this month—a species not much given to variation in plumage.

Kingfishers and the Floods.—Amongst the minor incidents of the floods which in November, 1878, caused so much destruction to property in and around Norwich, was the novel appearance of many Kingfishers within the bounds of the city, driven by the rising waters from their usual quiet haunts on the Yare and Wensum. For some days prior to the great inundation of the 20th of November they, no doubt, suffered privation from the difficulty of procuring food, every stream being more or less turbid and swollen, and the powerful current in the main rivers carrying everything seawards. When the final catastrophe therefore happened, on the 20th, and the waters above the New Mills, meeting with serious obstructions, diverted their course and

deluged a large portion of the low-lying parts of the city, these birds, driven from one foothold to another, as the waters rose higher and higher, found at last a temporary resting-place on the roofs and upper window-sills of the houses abutting on the river. Most of these, it is to be feared, died from want of nourishment, or, falling into the water from exhaustion, were drowned, as was actually witnessed in one instance at Carrow. In this case, the bird was seen to alight, again and again, upon any projecting branch or rail above the rushing waters, and as one after another of these became submerged he still pursued his course down stream till, at last, scared and exhausted, he fell backwards with a sharp cry, and was swept away by the torrent. One birdstuffer, alone, in Norwich had about twenty brought to him during the month of November, and chiefly in the week of the floods.

DECEMBER.

Little Auks.—One was brought into Norwich to be stuffed on the 3rd, and on the 16th another was picked up at Salthouse, and a third at Northrepps on the 18th.

Puffins.—Two birds of this species were sent up to Norwich on the 4th of December.

Stonechats in Winter.—On the 7th of December a birdcatcher brought me a young male Stonechat alive, but which lived only a day or two in my aviary, and I saw two in exactly similar plumage in a birdstuffer's shop on the 19th of the same month.

Crossbill.—I saw a single red male Crossbill, killed about the 18th.

Hawfinches.—During the month I have seen some nine or ten specimens killed in different parts of the county.

Bramblings, Siskins and Redpolls.—The severe weather towards the end of the month did not bring us the usual flocks of Bramblings, and it was not till the 21st that I could get a cock bird for my aviary, though they were plentiful enough after Christmas. Siskins were numerous, but I have heard of no Mealy Redpolls this winter.

White-eyed Pochard.—A bird of this species, shot at Yarmouth towards the end of December, is the only duck worth special notice that I have heard of on our coast this winter.

Purple Heron.—An immature bird of this species was, I am informed, shot in the neighbourhood of Yarmouth, and brought

to a game-dealer in that town between the 14th and 21st of December.

Raptorial Migrants.—On the 11th of May a female Hobby, assuming adult plumage, probably a bird of 1877, was shot at Northrepps; and another was seen in the same locality on the 15th. A Short-eared Owl was shot in Feltwell Fen on the 2nd of September, as recorded in 'The Field' by Mr. F. Doggett. A Honey Buzzard was seen on the 25th of September in the "Cottage Wood" at Northrepps. An immature Peregrine was killed at Shottesham on the 9th of November, and a fine adult male in the same locality on the 30th, on which date a Hen Harrier, female, was also brought into Norwich. A Merlin was shot at Knapton, near Cromer, about the 24th. On the 10th of December a Buzzard was seen at Northrepps (mobbed by Rooks), but not near enough to ascertain the species. One of the many so-called "Golden Eagles," but only *A. albicilla* in immature plumage, was shot at Fritton, near Lowestoft, about the end of December, and being but slightly wounded was captured and placed in the Yarmouth Aquarium, where I believe it still remains. Another was said to have been seen at the time on the same water, attracted as usual by the fowl frequenting the Fritton Decoy. This bird, as a "Scotch" Eagle and a "Golden" Eagle, was recorded in various London journals. During the severe weather towards the close of December, two Hen Harriers are said to have been shot off a tree near Yarmouth, and a Marsh Harrier and a Merlin were killed in the same neighbourhood.

ARRIVAL AND DEPARTURE OF MIGRANTS, AS OBSERVED CHIEFLY IN THE
VICINITY OF CROMER AND NORWICH.

- July 12 Two young Red-backed Shrikes observed at Northrepps being mobbed by a hen Chaffinch and a Wren.
- „ 25. A great quantity of Swifts observed at Northrepps going inland.
- Aug. 7. The early congregation of House Martins with an evident view to migration, which I recorded (Zool. 1878, p. 45) as occurring on August 16th, 1877, was witnessed in exactly a similar manner in 1878, on the 7th. At 7 A.M. the lofty slated roof of the chapel opposite my house was covered with these birds, and difficult as it was to estimate their numbers, from their restlessness, I satisfactorily counted over two hundred,

sitting in rows of thirty or forty together, on the roof, the stone copings, the eaves, and level ridge of the roof itself; all exclusively swarming on the sunny side of the building, and occasionally flying off in large flocks and settling again. I was obliged to leave home at 10 A. M., but even by that time the main body had disappeared, and only a few, comparatively speaking, were seen in the neighbourhood after that date. These I presume are the parents and offspring, whose nests, built early in the season, have met with no disasters, and who thus, freed from the anxieties of a second hatch, annually pass southward by short stages, influenced only by the weather.

Aug. 28. Large numbers of Curlew on Breydon.

„ 30. Two or three Rock Pipits on the Pakefield Cliffs, near Lowestoft, but not seen again. Several Snipes seen near Northrepps.

Sept. 1. A Turtle Dove at Northrepps. A young Cuckoo seen at Lowestoft.

„ 3. Swifts last seen near Lowestoft.

„ 6. Wheatears, seen daily on the Lowestoft Denes from August 31st, not seen after the 6th.

„ 7. Yellow Wagtail at Lowestoft.

„ 26. A female or young male Redstart flushed in a turnip-field at Northrepps. Just prior to this date a very considerable arrival of Snipes was observed in several parts of Norfolk; upwards of a hundred couples are said to have been flushed in the day in one locality. A few Pigmy Curlews at Lynn about this date.

Oct. 6. At 4 P. M. a flock of small birds was seen at Cromer flying low over the sea and making for land near the jetty. One bird was observed to lag behind, much exhausted, and when the main body reached the beach, and, rising at the sea-wall, mounted up and passed inland over the house-tops, this unfortunate, thoroughly worn-out, struck the wall and fluttered down into the sand. When picked up it proved to be a hen Chaffinch.

„ 11. Neither Swallows nor Martins seen in Norwich after this date. A large number of Snipes on Beeston Bog, near Cromer; all gone next day.

„ 13. First Hooded Crows (a small flock seen at Northrepps); others seen coming in from the sea on the 14th.

„ 17. A Woodcock seen at Trimmingham.

„ 19. A Wheatear seen at Northrepps.

„ 31. A House Martin seen at Cromer.

Nov. 2. A Woodcock flushed from my neighbour's garden on Unthank's Road, within five minutes' walk of Norwich Market-place. In June, 1877, one was caught alive in a greenhouse on the Newmarket Road, within a mile of the city.

Nov. 11. Fully twenty House Martins observed near the old boat-house at Keswick, and on the same day several at Cringleford, near Norwich.

„ 19. A Stone Curlew sent to Norwich from near Sherringham.

„ 24. A flock of about three hundred Jackdaws, with two or three Rooks amongst them, seen at Northrepps flying towards the sea in a N.W. direction.

„ 26. A Magpie, probably a migrant, seen at Northrepps.

Dec. 10 & 11. A very unusual number of Redwings observed at Overstrand and Northrepps, and a good many Fieldfares.

Between the 18th and 20th, through the severity of the weather, both Redwings and Fieldfares, but particularly the latter, appeared in considerable numbers in and around Norwich,—indeed in most parts of the county,—devouring every berry they could find, and eating their way southwards when such food failed them here. The main body had passed on by the 21st, leaving only, like an army in retreat, the wounded and sick behind, most of which were either stoned by the boys or died from exhaustion in a shocking state of emaciation.

[I much regret that many other and far less agreeable occupations, during the past year, have prevented my publishing these notes at a much earlier date.—H. S.]

NOTES FROM AN ARCTIC JOURNAL.

BY H. W. FEILDEN, F.G.S., C.M.Z.S.

(Continued from p. 108.)

By the morning of July 12th we had settled down in the tent at Dumbell Bay. A few Long-tailed Ducks were found in the neighbourhood, and several pairs of Buffon's Skuas sitting on eggs. During one of our walks we observed a Snowy Owl leave a hillock, where we found the nest—a simple depression scooped out of the ground. It contained three blind owlets, covered with white down, and four eggs in various stages of incubation.

During this excursion we found the retreats of two pairs of Foxes, and convinced ourselves of the interesting fact that these animals lay up stores of food for future consumption. We were disappointed, however, in not obtaining the principal object of our search, the nest and eggs of *Tringa canutus*. Three entire days were spent in the pursuit, and though we frequently saw

flocks of a dozen or more of these birds feeding together, and sprung them singly and in pairs from marshy spots, yet they gave no indication of having nests anywhere in the neighbourhood.

On the expiration of our week's leave Mr. Parr and I returned to the ship. Captain Markham and a party of four officers, who had also gone on a shooting expedition, were far more successful than my companion and I. They obtained two or three Musk-oxen and a considerable number of Brent Geese. They did not return to the ship until the 24th. During the last two weeks of July every hour that could be spared from the preparations incident to our expected departure was spent in wandering over the country and endeavouring to add to our knowledge of its resources. A few species of Spiders, some *Acaridea*, and a few Diptera, were the only additions made to my collection.

The 30th July proved cloudy, with snow. Three of our men taking exercise on shore, not far from a small lake, were attracted by the actions of a Knot which appeared very tame. Harley,* one of them, threw a stone at it, but the bird only flew a short distance. He threw another stone, and that time knocked it over, when it began calling. Its note brought out three little ones from amongst the vegetation by the water's edge. The pleasure of obtaining proof of the breeding of *Tringa canutus* in those latitudes was increased by the good feeling displayed by the men. They evinced quite as much delight as I did with the capture. This, however, was only on a par with my experiences throughout the whole of the voyage. The old bird proved, on dissection, to be a male; its stomach contained Spiders and Diptera, and it was extremely fat. The young ones had the iris black; tip of mandibles dark brown; bill dark olive; toes black; soles of feet greenish yellow; back of the legs the same; under part of throat satin-white; back beautifully mottled tortoiseshell.

On the 31st July the pack outside moved off shore, leaving a narrow space of water visible as far as Cape Rawson. A few heavy charges of powder removed the last of the ice-cradle, and the ship was once more afloat. The passage of Robeson Channel was extremely perilous; it was only by a combination of consummate skill, audacity, and good luck that it was effected. On August 3rd we were hemmed in by the ice, and nearly pushed on to the land,

* This worthy petty-officer was lost in the 'Eurydice' off the Isle of Wight, March, 1878,

at the same place where, on the 29th August of the preceding year, we changed our damaged rudder. From Floeberg Beach to that point I had only observed one Ivory Gull, one Snow Bunting, and a dozen Black Guillemots; but from thence southwards bird-life was far more abundant than along the shores of the Polar Ocean.

At Shift-rudder Bay, where we were detained for eight days by the ice, we had numerous excursions on shore. One day we bagged fifty-seven Brent Geese, and another day seventy. At that date the old birds were moulting and the goslings unable to fly. Turnstones and Sanderlings, with their young, were not uncommon, and Buffon's Skuas and Arctic Terns were tolerably numerous. The Skuas were generally accompanied by a pair of young ones, which were then in the mottled nestling plumage, without any development of the centre tail-feathers, and hardly able to fly. The old birds endeavoured to mislead us by several devices, feigning lameness, falling to the ground, and pushing themselves along the ground on their bellies as if wounded; then, when they thought they had sufficiently attracted us from the young, they rose in the air, uttering their peevish cry of "quirk, quirk."

On the 10th August the young of the Knots were following their parents on the wing. I observed that the old birds showed very little red on their breasts by the 3rd; on the 8th only a few red feathers were left, and on the 10th only a tinge of earth-red was left on the outer edge of a few of the breast-feathers.

A favourable change having taken place in the ice, on the evening of the 11th August we gained Discovery Bay, and, after nearly a year's separation, were again anchored close to our consort. The pleasure of meeting was somewhat marred by the knowledge that Lieut. Beaumont and his party had not yet returned to the 'Discovery,' but were still encamped on the opposite or Greenland side of the channel. The ice in the straits having broken up rendered it questionable whether this party would be able to cross unaided. Capt. Nares therefore decided to force the 'Alert' across the channel to the relief of these men. The sick and all hands that could be dispensed with, as well as our journals and collections, were transferred from the 'Alert' to our consort, and once again we were outside of our friendly haven, battling with the ice in Robeson Channel.

At mid-day of the 14th, to our great joy, Beaumont's party was descried on the moving pack. Not a minute was lost in despatching a relief party from the 'Alert,' and early on the following morning every surviving member of the Expedition met together. The two vessels were detained a week longer in Discovery Bay before the ice in the channel gave us an opportunity of moving southwards. This was a very enjoyable period of the voyage, as the weather proved remarkably fine, and though we were never able to be absent for any length of time from the ships, yet we had many opportunities of landing.

Earlier in the year, Mr. Hart, the naturalist on board the 'Discovery,' had found a seam of coal of great thickness exposed in a valley a couple of miles north of their winter-quarters. On my first visit, in company with Mr. Hart, to this interesting spot we discovered a few leaf-impressions, which seemed undoubtedly referable to plants that had already occurred in the Miocene deposits of Greenland and Spitsbergen. We therefore concluded that this coal-bed was a lignite of Miocene age, and not true carboniferous coal. On a second visit to this locality, I formed a very considerable collection of these leaf-impressions.*

On our return to Europe this collection was submitted to Professor Heer, of Zurich, with the following results:—He found the collection to contain twenty-six species of plants. Of these eighteen are known from the Miocene deposits of the Arctic zone. It shows seventeen species with Spitsbergen (latitude 76°—79° N.) and eight species with Greenland (latitude 70°—71° N.). The Grinnell Land flora consequently more closely approaches the Miocene of Northern Spitsbergen, which lies from three to four degrees of latitude farther south than that of Greenland, situated almost eleven degrees farther south. With the Miocene flora of Europe it has six species in common, with that of America (Alaska and Canada) four, and with that of Asia (Saghalien) four also. Representatives of plants now living exclusively in the Arctic zone are wanting among the fossil species of Grinnell Land; but, on the other hand, most of the genera still extend into the Arctic zone, viz., *Equisetum*, *Pinus*, *Phragmites*, *Carex*, *Populus*, *Betula*, *Corylus*, *Ulmus*, and *Nymphaea*. Of these, however, only *Equisetum*, *Carex*, and *Populus* extend

* This collection, now in the British Museum, has been figured and described by Prof. Heer, 'Flora Fossilis Arctica,' vol. v.

beyond latitude 70° N.; the remaining genera do not extend so far.

Professor Heer records as a very interesting fact that in Grinnell Land two twigs of the spruce (*Pinus abies*, Linn.), still covered with leaves, were found. He had already received single detached leaves from Spitsbergen; with them there were seeds of this species, and, further, there was also found a scale of the cone, so that the species could be determined with perfect certainty. We therefore see that our spruce was living during the Miocene period in Grinnell Land as well as in Spitsbergen, and at that time doubtless extended as far as the Pole—at least, if any dry land then existed there. In Europe the tree did not then exist; hence, in all probability, it had its original home in the extreme north, and has thence extended southwards. Its extreme northern limit is now in Scandinavia, latitude $69\frac{1}{2}^{\circ}$ N.; and it is now spread over about twenty-five degrees of latitude, whilst during the Miocene period it was limited to the Arctic zone.*

It appears to me that these conclusions of Professor Heer must be of very great importance to every zoologist who makes the origin of species a study. If our common spruce, as he demonstrates, originated at the Pole itself in Miocene times, and has gradually extended southwards in consequence of the cooling of our globe, it is surely not unreasonable to suppose that various species of plants and animals have accompanied the spruce in its movements southward until checked by the increase of temperature. Unless some such theory as this be admitted, it is difficult to account for the distribution of certain animals in the northern hemisphere.

As an example, let us refer to certain species of birds which may be denominated Arctic species, such as the Ivory Gull and Ross's Gull. Mr. Howard Saunders has recently published† a valuable essay on the geographical distribution of the Gulls and Terns; and the conclusion he arrives at is that the bulk of the evidence adduced indicates the North Pacific as the centre of dispersal of the *Laridæ*. Mr. Saunders, however, expressly excludes the two isolated and specialized genera of Gulls, *Pagophila* and *Rhodostethia*, from his generalizations, as they are not known in the North Pacific. *Pagophila* and *Rhodostethia* can only

* Heer, 'Quarterly Journal Geol. Soc.,' February, 1878.

† 'Journal Linnean Society,' Zoology, vol. xiv.

be admitted as stragglers to the North Temperate area of the globe; but if we consider these species to have originated within that area, their present distribution is not easily explained. If, on the other hand, we admit Professor Heer's conclusion, that one of the commonest of our northern forest trees originated at the Pole, and extended southwards, the same may apply to various species of animals whose range is now confined to Arctic and high northern latitudes.

Bellot Island, which forms the protection of Discovery Harbour, was frequently visited, as our ships lay moored for several days close to its shore, awaiting the opening of a water-way in the outside pack. On the low spit which stretches from the northern end of that island we found several remains of Eskimo encampments. Near to one lay a single horn of the Reindeer, and a few pieces of drift-wood. Hares were numerous on the island, but before our departure we had nearly extirpated the race. Two Ermines were also secured. On several occasions we managed to have hauls of the dredge inside Discovery Harbour, but at no greater depth than twenty or thirty fathoms.

Early on the morning of the 20th August, under the influence of a strong southerly wind, the open water which had been observed for several days off Cape Baird seemed inclined to open up a lead in the direction of Discovery Harbour. Advantage was at once taken of this favourable opportunity, and after a severe battle with the heavy floes that had accumulated in Hall Basin and imprisoned us in Discovery Harbour, we reached clear water off Cape Baird, and ran gaily down Kennedy Channel to the southward. Just off Cape Baird a flock of twenty Brent Geese passed close over the ship, hurrying to the southward—a plain warning that the navigable season in Smith Sound was fast drawing to a close.

As we passed close along the coast, and as little snow lay on the line of shore-hills, we had a favourable opportunity of observing the general structure of the coast. At Cape Lieber, an abrupt and imposing headland, the strata are wonderfully contorted and crumpled up: in this respect they agree with the coast-line of Grinnell Land as far north as Cape Rawson, and I have no doubt belong to the same series of azoic slates and limestones. To the southward of Cape Lieber a different formation evidently occurs. Instead of the dull grey which is the

prevailing tint of the Cape Rawson beds, the rocks we were then passing presented a highly coloured strata, which appeared for miles in mountains and valleys. The colours of these strata were so remarkable and so intense that we had no difficulty in tracing their outcrop for miles. A black, a carmine, and an orange series especially attracted our attention.

On the morning of the 20th we found the ice closely packed off Cape M'Clintock and closing in on the land. We therefore retraced our course some eight miles and took refuge in a fine fiord, to which was given the name of Rawlings Bay. We moored to the land-ice, and I shortly afterwards went on shore with Mr. Parr. Along the shores of this fiord, and close to the water's edge, we discovered many remains of Eskimo "igloos." In one sheltered nook we counted the sites of twenty dwellings. They were evidently very ancient, the stone walls having fallen in and become buried under a layer of peaty earth; indeed these ancient abodes were only recognizable by the extra green of the moss that covered them. We opened one of these mounds, and after rolling away the stones that had once formed the roof, found several pieces of carved ivory-work buried in the earth that filled up what had been the dwelling-room. Continuing our walk along the shore we came across the skeleton of a Reindeer; it was evidently of recent origin, as pieces of skin and dried flesh adhered to the skull.

After leaving Rawlings Bay on the 22nd the weather rapidly changed for the worse. Snow commenced to fall, and in a few hours the line of shore-hills became covered with their winter mantle. A single Glaucous Gull and numerous "dovekies" were seen, and one or two Ringed Seals. As we approached Cape Frazer, the meeting place of the Polar and Baffin Bay tides, the difficulties of navigation greatly increased. Off that Cape we were hemmed in by the ice, and had to take refuge in a small bay. On the 24th our ships rounded Cape Frazer. Progress was only effected by taking advantage of every movement in the heavy ice-barriers which offered a lead, and by clinging to the shore. Three more days of unceasing exertion on the part of officers and men, guided by our skilful leader, brought us safely along some ten or fifteen miles to Dobbin Bay, where we obtained comparative safety.

The coast-line from Cape Frazer to Dobbin Bay consists of abrupt mural precipices, fringed with a broad and solid ice-foot.

No bay or indentation throughout this stretch of shore-line offers a chance of shelter to a vessel. The solid pack which filled Smith Sound, without a break or trace of water,—as far as we could judge from the mast-head or our observations from shore,—was ever moving slowly southward, grinding against the coast. At capes or headlands, or wherever the progress of the pack was interfered with, the great power of moving ice was exemplified. At those points of pressure the floes pushing against the ice-foot seemed to be imbued with life and instinct. An enormous floe impinging against a headland is brought momentarily to a stoppage, the check is transmitted to the floes in rear, and a scene of commotion is visible for a great distance in the pack around. Like an angry crowd jostling against one another, the edges of the various floes grind, uprise and crumble upon themselves. The weight from behind at length overcomes the obstruction of the grounded edge of the floe, which is crumpled up and pushed upon the ice-foot a chaos of hummocks. If this scene of conflict between the moving ice and the headlands was incessant it would be impossible to carry a ship around these points, but fortunately the pack is ever changing position. Wind and tides exert tremendous influence upon it. A change in either of these agencies often converts an area of raging ice into a breadth of smooth water in the course of a few minutes.

On the 29th August we landed on the north side of Dobbin Bay, and coming across a brood of Ptarmigan, nine in number, secured them all. They were young birds changing into winter plumage, and proved quite unsuspecting, allowing me to shoot them as they ran amongst the stones. The weight of these young birds averaged sixteen ounces. Four or five Hares were also obtained; one of the largest weighed ten pounds two ounces. Dr. Moss shot a female Raven, and a few Snow Buntings were still lingering along the shore.

Four more days were we beset in Dobbin Bay, without getting a chance of moving into the Sound. The time, however, was not passed unprofitably, as we had several good hauls with the dredge. Dovekies were numerous, and appeared still to have young, as I noticed them flying up to the cliffs with fish in their bills. Many broods of Eider Ducks, *Somateria mollissima*, were swimming in the pools, and we shot a considerable number. It is worthy of remark that south of Cape Frazer the Eider seems

to be far more numerous than the King Duck, *S. spectabilis*, whilst north of that cape the reverse is the rule. Beyond Cape Union, in the Polar Basin, I did not see or obtain a single Eider Duck.

(To be continued.)

OCCASIONAL NOTES.

ROE-DEER AND MARTEN-CAT IN DORSETSHIRE.—In the review of my ‘History of Glanville’s Wootton,’* the reviewer remarks that it is to be regretted I did not give more information about the Roe-deer in the county of Dorset. I will now do so. Some were turned out at Milton Abbey, about the year 1800, by the first Lord Dorchester, who brought a buck and two does over from Ireland. One of the latter died. They were entrusted to the care of Mr. William Flower (whose nephew is still alive), who kept them until the large woods at Milton Abbey were finished planting, when they were turned loose. Another couple were afterwards brought from North America. After a few years they increased so much that Mr. Pleydell, of Whatcombe, kept a pack of hounds for hunting them. In Melborne St. Andrew’s churchyard is a stone to the memory of W. Price, a faithful servant of the Pleydell family, who had the care of the hounds, and was the first man in the county who hunted a pack for Roe-deer. In more recent times, the late Rev. H. F. Yeatman hunted them occasionally with his harriers, the meets for which were advertised in the Dorset county papers. Several gentlemen, amongst others my grandfather, used to hunt them with greyhounds. The Marten-cat, besides having been killed at Halnest, has also been killed at Stock, and the Pine Marten at Blandford. In his ‘Anecdotes of Cranbourne Chase’ (1818), the Rev. W. Chafin says:—“Packs of hounds have even been kept in the neighbourhood of the Chase, and hunted there in the proper seasons. There were three sorts of animals besides Deer, *viz.*, Hares, Foxes, and Marten-cats. The last-named are nearly extinct, owing to their skins being so valuable.” There were several wild Deer in Dorset, probably Red Deer, and on the first page of my ‘History’ is the account of a white one being killed in the reign of Henry the Third.—C. W. DALE (Glanville’s Wootton, Sherborne).

[The Roe-deer is not indigenous either to Ireland or to North America, and we never heard of its being introduced in either country. We venture to think, therefore, that our correspondent has been misinformed as to the origin of the animals turned out by Lord Dorchester.—ED.]

MARTEN-CAT IN CUMBERLAND. — The Marten-cat, or Sweetmart, is distributed in greater or less numbers over the mountainous parts of Cumberland. It is most abundant in Borrowdale, Scathwaite, and Wastdale, where it is hunted with fox-hounds. When chased it invariably makes for the rocks, and takes refuge in the crevices among them. It has been known to run to and through woods, but will never run to trees if there is a rock "handy." It is soon overtaken by dogs on ordinary ground, but over rocks and stones it goes at a great pace, and is exceedingly difficult to come up with at first; but as it cannot go much over a mile without resting in some crevice, it is tracked to its hiding-place, and if possible drawn by a terrier. It fights fiercely for a time, but is soon overpowered by the superior strength of the dog. When fighting it uses its claws more than its teeth. It very frequently escapes after being run to earth, owing to its being able to creep into such a very small hole. I have never heard of one being seen in the bottom of the valley, though the trail is sometimes struck there by the hounds. Some of those killed had breasts nearly white, and some of nearly a golden colour. They feed upon young lambs, birds, moles, frogs, and even old sheep, which latter they kill by getting upon the back of the animal and biting it "under the ear" (probably the jugular vein). One has been known to so terrify a sheep by chasing it as to cause it to jump over a precipice, and so kill itself by the fall, while the wily little animal ran round by some easy descent to feast upon the mangled remains. This occurred, I believe, in Borrowdale. They are especially destructive to young lambs. The young have frequently been found in the district. They are born about the end of April or beginning of May, and are two or three (never more) in number, and of a much lighter colour than the old ones. They breed on the fell-sides, at a higher or lower elevation, according as they have been much disturbed or not. The breeding place is generally some well-chosen hole amongst the rocks, near to which is a small piece of grassy ground with brackens or other cover. It is never in what the dalesmen call a "strong" place—that is, rough and precipitous—where the young might get hurt if they fell over. Owing to the difficulty in drawing them when run to ground, not more than four to six are killed by the hounds each year, though often chased. They have decreased in numbers of late years. I may add that I have gathered most of this information from the huntsman of the Wastdale-Head Hounds, and it may be accepted as the reliable testimony of an eye-witness; in fact, as the evidence of a man who has probably seen more Marten-cats than any one in England.—CHARLES A. PARKER (Gosforth, Carnforth).

MARTEN-CAT IN DORSETSHIRE.—I believe the last Marten-cat was killed in the Chase Woods by the late Mr. Chafin's hounds, about the year 1804,

under the following circumstances :—To escape the death which awaited it after running a considerable time before the hounds, it climbed a high tree, and thus baffled its pursuers, but, alas ! only temporarily ; for next time the covert was drawn Mr. Chafin ordered his keeper to attend with a gun charged only with powder, and in case the Marten-cat “ took to tree ” again, to fire at it. It was soon found again, and once more when hard pressed sought the friendly shelter of a tree. The keeper, however, was at hand, and, according to previous orders, fired. The little animal immediately dropped to the ground, and allowed itself to be caught without venturing a third time an arboreal refuge.—J. C. MANSEL-PLYDELL (Whatcombe, Dorsetshire).

MARTEN-CAT IN NORFOLK.—About the end of June or the beginning of July, 1878, a Marten was caught in a trap set for a rat, in a fir plantation in the parish of Hevingham, Norfolk. I learn from several persons who saw it alive in the trap, and immediately after it was killed, that it was not injured, and that the fur was in perfect order ; also that the man who caught it led it home in the trap, holding the chain in his hand whilst the poor beast trotted tamely along by him. The Hevingham people were undecided as to whether the beast was a Fox-cub or a Polecat ! I sent a notice of it to ‘ The Field ’ and to our local newspapers, with the object of learning if such an animal had escaped from confinement, but I have not heard anything to that effect.—FRANK NORGATE (Sparham, Norfolk).

BREEDING OF THE OTTER.—On December 28th three young Otters, apparently less than a fortnight old, were found in a large nest formed of rushes and sedge among the reed-beds near Castle Mills. They consisted of one male and two females, and were unfortunately destroyed. This is in accordance with Mr. Southwell’s opinion as to the time and number of the litter. I have one of the luckless little creatures ; it is a male, and measures twelve inches and a half from nose to tip of tail. Otters are not yet extinct in the Ouse, though of rare occurrence. Mr. Covington has only had one to preserve for years ; but I received an authentic notice of an old Otter shot higher up the river, near Buckingham, about the same date.—C. MATTHEW PRIOR (The Avenue, Bedford).

ALBINO HEDGEHOG.—Mr. Wright received an albino female Hedgehog to stuff. It was caught by the gamekeeper at Wrest Park about the middle of December.—ID.

VARIETIES OF THE HEDGEHOG, BADGER AND MOLE.—A white Hedgehog, about half-grown, was killed in the neighbourhood of Malvern during the month of October last, and brought to Mr. Edwards, naturalist, for preservation. Strange to say, it did not possess pink eyes like an albino, but purely white ones. The same naturalist has in his possession a yellow

Badger and a yellow Mole, both recently taken in the same county.—ISAAC HARDING (Malvern).

MORTALITY AMONGST SHREWS.—Probably the greater part of the Shrews so often seen lying dead on footpaths [see p. 124] are killed by Owls in mistaking them for mice. Although the remains of Shrews have been found in the stomachs of Owls, I believe that unless they are very hungry they are generally rejected by these birds. They do the same, but to a greater extent, with Moles. When a boy I had a Long-eared Owl. Being in the country, where there was no butcher, I had sometimes great difficulty in procuring food suitable for it, and occasionally, when in one of these straits, I have gone in search of mole-traps, and taken the contents for the Owl, and even when very hungry it would eat no part of the Mole except the entrails —ANDREW BROTHERSTON (Shedden Park Road, Kelso, N. B.).

[Remains of Shrews have been detected in the pellets ejected by the Barn Owl, and Mr. Bell has shown that the notion that these birds will kill but not eat Shrews is erroneous. See 'British Quadrupeds,' second edition, p. 144.—ED.]

BEWICK'S SWAN IN SOMERSETSHIRE.—My friend the Rev. R. C. L. Browne, Vicar of North Currey, who was greatly interested by the visit of a flock of Bewick's Swans to the moors in his parish, has given me the following particulars:—The flock numbered about sixty birds, and frequented the neighbourhood of North Currey for a month. The birds were remarkably wary, and although many gunners were on the watch for them only one succeeded in obtaining a shot. This was a labourer who with a single-barrelled duck-gun knocked over four; two were obtained, two were only slightly wounded, and escaped. One of the two was sold to Mr. Foster, of North Currey; the other my friend the Vicar was anxious to secure, but arrived at the labourer's cottage just as he and his family were sitting down to a dinner off roast swan. A slice off the breast, although tasting both juicy and tender, seemed but a poor equivalent for the loss of what would have been valued as an interesting local specimen. During the day the swans flew about from one "washet" to another. "Washet" is the local name for open places in the ice on the moor. The birds flew in a wedge formation, uttering musical cries, and as they alighted hovered for an instant with uplifted wings above the ground, "looking then like a descending flight of angels." A smaller flock, numbering sixteen, appeared on the southern edge of the moor in the neighbourhood of Glastonbury. Of these four were procured, as mentioned by Mr. Porch in 'The Field' of February 22nd. Two of the four have been presented by that gentleman to the Taunton Museum, and are a very interesting addition to the collection of birds of the county. One is a remarkably fine adult; the other, almost an adult, has a little rust-colour on the forehead and breast.

Mr. Bidgood, the Curator of the Museum, informed me that both examples were females. My own parish received a visit from these beautiful little swans. Mr. Esdaile told me that four were seen for several days on the lake in his park at Cothelstone, and that before the birds left him their numbers were increased to seven. One was either a wounded bird or had received a severe handling from one of the tame swans on the lake, for it fell a prey to a prowling fox, and was found half-eaten on the bank. The head, that of an adult, was presented to Mr. Cecil Smith. I am informed that one of the four birds obtained near Glastonbury was only slightly wounded, and is still alive. Placed with other birds it became tame at once; thus bearing out what has been frequently stated by writers concerning the domesticity of this species. A friend when snipe-shooting on the moors to the east of Taunton came across a small flock of Bewick's Swans, and had an ineffectual shot into them. He was struck by their small size, and said that they seemed more like wild geese than swans. Some Brent Geese appeared on the same ground where the swans were noticed, and two were shot at a spot considerably inland for a bird which usually confines itself to the coast.—MURRAY A. MATHEW (Bishop's Lydeard).

RARE VISITORS TO THE MALVERN HILLS.—A pair of Ring Ouzels nested on these hills last summer, and remained here with their young all the winter. A pair of Woodcocks bred in the picturesque woods of Eastnor last spring, at which time the firs lining the southern slopes of the Herefordshire Beacon held a pair of Buzzards, which nested in them, but of course soon fell a prey to the gamekeeper's gun. I am glad to believe that our Natural-History journals have aroused public opinion in favour of that beautiful bird, the Kingfisher. As far as my observation goes, it increases in this county. One has frequented an ornamental pond in the grounds of a lady in the very centre of the town, and although the premises are occupied by a large school for young ladies, it sees no cause for alarm, but continues to feed on the small fish in the water referred to. I must not forget to mention the occurrence of the Great Northern Diver in the Severn, about fifteen miles from its mouth, on the estate of Sir Edmund Lechmere, and which was shot by his keeper. The bird is an adult male and in splendid plumage. The Eared Grebe has found its way up the canal into the very heart of Worcester, and has of course forfeited its life, and may now be seen at Mr. Edwards' office. A Royston Crow kept company with a flock of Rooks on the hills for some weeks, but was at last killed.—ISAAC HARDING (Malvern).

[The fact of Ring Ouzels remaining here in winter is noteworthy, since the majority quit this country in October, not to reappear until the following April.—ED.]

BIRDS ON THE EAST LOTHIAN COAST IN FEBRUARY.—Since the late frosts have subsided, shore-birds have somewhat decreased on this coast; a sufficient number of species still remain, however, to allow of many interesting observations. The Merlin, *Falco aesalon*, is at present comparatively common in the neighbourhood of the Tyne-mouth and Scoughal rocks, between the Seacliff estate and Dunbar. On the 15th I observed several of them hunting in the vicinity of the rocks at low tide. The Peregrines. I am glad to say, are still frequenting the Bass Rock, and I had lately an opportunity of observing one of the birds, as it flew past me within easy gunshot and continued its flight seaward in the direction of the island. I should think it probable that they make a prey of the Pigeons which frequent Tantallon in some numbers, and breed among the ruins. There is also a breeding place of the Kestrel on this part of the coast, and the birds are generally to be seen in the neighbourhood. Of sea-birds nothing of any importance has occurred this winter. The Glaucous Gull, *Larus glaucus*, has often been shot near Seacliff. One part of the coast to the west of Dunbar is very rocky, and this is a favourite resort of the Purple Sandpiper, *Tringa maritima*. It is to be met with every now and then in small flocks at the water's edge, either when the tide is flowing or receding. Dunlins, Sanderlings, and other waders are also common, and met with in large flocks. Large numbers of ducks and geese have been shot on the coast during its hard weather. The Bean Goose, *Anser segetum*, is rather common. I lately observed a flock of nine resting on the rocks at low tide. The birds appeared to be comparatively tame, allowing me to make a near approach. This bird is mentioned by Mr. Gray, in his 'Birds of the West of Scotland,' as frequenting the sands in the neighbourhood of the Tyne Estuary at nightfall, and at daybreak retiring to the Lammermuirs.—C. E. S. CHAMBERS (339, High Street, Edinburgh).

RARE BIRDS IN BEDFORDSHIRE.—I herewith send you notes of the rarer species of birds shot in the neighbourhood of Bedford during the last few months. As this county seems never to have been worked at all, I have made mention of some birds which are of frequent occurrence, but yet, owing to a strange lack of ornithologists in a very rich district, have never been recorded. There cannot be a greater proof of the paucity of observers, than the fact that Mr. A. G. More, at the time he was employed in tracing the distribution of birds in the nesting season, had no correspondent in this county. Mr. A. Covington, taxidermist, Bedford, has kindly furnished me with many particulars of rare birds which were brought to him for preservation. In September last a Greenshank was put up out of a ditch in Goldington, and shot. The Ringed Plover was exceptionally abundant last autumn; no less than seven were sent to be stuffed in one week. A Black-headed Gull was shot near Castle Mills in August last. This county

is still a stronghold for the Greater Spotted Woodpecker. Ornithologists will hear with regret that at least five examples have been lately shot. I had the pleasure of seeing one in Bromham Park on the 7th February. As usual several Short-eared Owls, exhibiting a great variety of plumage, were killed in the autumn. On November 5th a Long-eared Owl was obtained at Sharnbrook. Since Christmas a great many Bramblings have been brought into Bedford, but no Snow Buntings. In the last week of December a pair of Leach's Petrel visited Bedford. They were heard flying round the town, uttering their note for some time. In the morning, however, one was picked up, having apparently dashed itself against one of the lamps. Mr. Covington kindly showed the bird to me; it seems to be an adult male. Two or three specimens of the Great Crested Grebe have been observed on the river this winter; one was picked up by a plate-layer under the telegraph-wire at Milton, and a second was shot at Kempton. A specimen of the Little Auk was picked up dead at Husborne Crawley, on the 8th December. Three old male Tufted Ducks have been shot. This species is to be met with here every winter. One Pochard, a male, has been obtained. I am told four Goldeneyes were shot at Willington; none were preserved. An extraordinary number of Herons have been killed, and many also have been eaten. This seems like a return to olden days, when our omnivorous ancestors thought no feast complete without a Heron. We usually find Water Rails here in the winter, and this one has been no exception. Fewer Hawfinches than generally is the case have been killed. Two males were shot, one at Turvey, the other at Pavenham, and a single female down the New Cut, near Bedford. Three were seen together in Bromham Park. A "flock"—I suppose, technically, it should be termed a small "gaggle"—of nine Canada Geese were observed on the river in several districts. One was shot on the 28th January; I saw it soon after it was skinned, and was assured that it "scaled" over twenty pounds. I should be glad to learn whether a Canada Goose ever has been known to reach that weight. It seems free from any "cross," and exhibits no mark of captivity. The length was about forty-three inches; from the carpal joint to the end of the wing fully twenty inches. The bird was killed at Sharnbrook. Three Kittiwakes, all immature, and several Common Terns were obtained during the autumn. More Coots than usual have been met with on the river during the winter. A few Widgeon, all birds of the year, were procured. A friend tells me he saw three Dunlins in a ploughed field near the town. Dunlins have been remarkably scarce here this winter. Last year I only noticed sixteen, and did not hear of others; but in former years large flocks have visited us. I should think quite two hundred were shot in the winter of 1875-76. The same day the Dunlins were seen, about the middle of December, nine Curlews were noticed in the same field. Snipe were very abundant, as also were Golden Plovers and Lapwings before the

frost set in. Both Siskins and Redpolls have been numerous. Mr. J. S. Wright, the taxidermist, at Clifton, in this county, kindly informs me that a male example of the Peregrine Falcon was sent to him for preservation. It was obtained at Ickwell Bury, by J. Law, gamekeeper, on February 4th. A fine male Bittern was shot near Shefford on January 27th. One has not been procured here, I believe, for some years. Several Grey Crows have been obtained near Bedford this year. This is the more remarkable as a little further north they are not met with (*cf.* Yarrell, 4th edit, p. 285, note). The Black Crow is very scarce here.—C. MATTHEW PRIOR (Bedford).

WHITE'S THRUSH IN BERWICKSHIRE.—There is no doubt whatever that the Thrush shot at Hardacres (p. 133), in the last week of December, 1878—not September, as misprinted—is the true *Turdus varius*, Pallas (*T. Whitei*, Eyton). After reading my notice of its occurrence which appeared in 'Land and Water,' Professor Newton, through the same paper, expressed his desire to see it, which he has now done. He writes:—"On comparison with a specimen that has been long mounted, the fresh beauty of the colour in yours is very decidedly marked; yet I fear that nothing can be done to preserve its tints, and that when as many years have elapsed their richness will have disappeared. I have wholly failed to find any indication that would enable me to determine the sex or age of your bird. . . . There is no question about its being the true *Turdus varius* of Pallas, though the tail is wanting, an unfortunate thing, as therein lies one of the most curious characters of this species—one that is possessed, so far as I know, by only one other species of Thrush—the presence of fourteen instead of twelve rectrices." In the description of the wings taken from 'Land and Water' the words "right" and "left" should be transposed.—ANDREW BROTHERSTON (Kelso, N. B.).

NOTE ON WHITE'S THRUSH.—As I believe that collectors are occasionally deceived by Thrushes nearly allied to White's Thrush being sold as that species, it may be interesting to know the whereabouts of some of these specimens. There is one at Mr. Swaysland's, the well-known bird-stuffer, at Brighton, and two in the Thurso Museum. One of these latter is labelled "Variety of the Redwing from Shetland;" but there is no good reason to believe it was killed there, foreign birds being mixed indiscriminately with British in the collection. I fancy that all three birds are either *Turdus dauma* from India or *T. lunulatus* from Australia. They are darker in colour than the true *T. varius*, if my eyes did not deceive me; but are at once distinguishable as belonging to that section of the genus *Turdus* by their large curved beaks and crescentic markings on back and breast. I rather wonder the alleged or mis-labelled Shetland specimen has not been recorded as a British-killed White's Thrush, but I suppose the Thurso Museum has not often been visited by ornithologists.—CLIFTON.

SPRING CALL OF THE KNOT.—In reading Captain H. W. Feilden's interesting "Notes from an Arctic Journal," I was much struck with his description (p. 102) of the summer call of the Knot heard on the shores of the Polar Sea, and which he compares to the words "Tullawee, tullawee, whee, whee." How strikingly does this resemble the spring call of the Golden Plover, which indeed I can only imitate by using the same word, "Tue, tullawee, tullawee, tullawee," uttered in a descending scale. In these marshes we always hear the note of the Golden Plover during the first fine days from the middle of February to the end of the month. The weather this year in February was so severe, and the temperature so abnormally low, that our spring songsters have kept silent. The 1st of March was really the first fine spring-like day of the season, and I heard Blackbirds, Thrushes, Mistletoe Thrush, Larks, and Yellowhammers and Black-headed Buntings, singing together, and far off, from invisible positions, in the clear blue heavens, came floating down in mellow cadence the sweet but mournful spring call of the Golden Plover. After all the extraordinary severity and discomfort of the past winter, we trust our spring songsters have not made a mistake, and may have occasion to relapse into their ordinary winter notes. I wish to correct an error in my last communication to 'The Zoologist,' p. 127, twenty-third line, for "below zero" read "above zero."—**JOHN CORDEAUX** (Great Cotes, Ulceby).

OBSERVATIONS ON EGG-BLOWING.—Under this title, in 'The Zoologist' for 1877, p. 164, are to be found some excellent observations on blowing eggs, and the description and figure of a bellows invented for the purpose by Mr. E. Bidwell. The only object I have in writing is to suggest to oologists, instead of using the cylindrical leather bellows described by Mr. Bidwell, to substitute a perhaps more satisfactory instrument—*viz.* a Clarke's spray-producer. This instrument is worked by merely squeezing the end ball, and, according to the rapidity of pressure on it, a current of air, strong or weak, is expelled from the tube attached to the second ball. This tube is attached to the blow-pipe by slipping it over the blow-hole, and the apparatus is complete. I used this contrivance last season, and found it answer very well. I had no breakage (as far as blowing was concerned), although I blew several dozen eggs ranging in size from a Heron's to a Golden-crested Wren's. The spray-producer (the bellows being the only part required) may be procured of any chemist or surgical instrument maker, and costs about five shillings. I also found it an advantage to tie a small piece of wadding or tow near the end of the blow-pipe. By this means the contents of eggs, which are liable when blown out to run along the blow-pipe and soil the stand and table on which it rests, are diverted, and following the course of the tow, reach the saucer or receptacle placed beneath to receive them. A syringe for washing the inside of eggs after blowing is

easily made in the following way:—Place the centre of a small piece of glass-tubing, about three inches long, in the flame of a blow-pipe. When thoroughly red, draw it out gradually with both hands and allow it to cool. When the tube is afterwards broken at the narrowest part and both ends separately placed in the blow-pipe flame it will be easy to smooth the sharp glass at the points where broken. Now insert the other end of either piece in the hole of a boy's common india-rubber ball previously filled with water, and you will have a capital syringe. Two or three pieces of tubing, with different sized nozzles to suit the eggs to be blown, will be found necessary. In this way any one can make, with very little trouble, a syringe for very small eggs, probably with a finer point than any to be purchased.—WILLIAM W. FLEMYNG (18, Upper Fitzwilliam Street, Dublin).

NESTING OF THE GREY WAGTAIL IN OXFORDSHIRE.—Prof. Newton, in the fourth edition of Yarrell's 'British Birds,' p. 554, speaking of the nesting-haunts of this species, says:—"A line drawn across England from the Start Point, slightly curving to round the Derbyshire hills, and ending at the mouth of the Tees, will, it is believed, mark off the habitual breeding-range of this species in the United Kingdom: for southward and eastward of such a line it never or only occasionally breeds." It may be as well, therefore, to record the fact that in the summer of 1875 I repeatedly saw a pair of Grey Wagtails in an osier-bed in the parish of South Newington, in the above county. They frequently carried food in their beaks, but I was unable to hit upon the exact spot where the nest was. The parent birds were much agitated when I came closer to them, and, owing to the extreme seclusion of the place, they had probably never been disturbed. This osier-bed is situated by the side of a small river, the Swere, locally celebrated for its trout. I think I may say I have seen this species in Oxfordshire, nearly, if not quite, in every month in the year. It is well known to breed in the neighbouring county of Bucks.* It is fond of feeding in the vicinity of mills, in one favourite spot. I consider it an excessively local bird. I saw a pair in the first three months, June, July, and the last three months in last year. Along the sides of the Ouse in Bedfordshire, in August, they were wonderfully numerous; small parties of five or six were constantly met with, often feeding in company with the Common Sandpiper. The last I saw in Oxfordshire was on December 17th, when I found a fine male in a drain which usually held Snipe. I knocked it over, and have it stuffed. I never look at that bird without a smile, as a friend who was with me missed it three times in succession; its peculiar flight, with its deep regular undulations, fairly puzzled him.—C. MATTHEW PRIOR (Bedford).

* See 'Birds of Bucks and Berks,' p. 26; also Gould, 'Contr. Orn.,' 1849, p. 137, quoted by Prof. Newton in the passage above referred to.

HAWFINCH NESTING IN YORKSHIRE.—On visiting one of our local bird-stuffers lately he showed me an immature Hawfinch, which he received in the flesh in June or July, 1878, and which had been captured at Myrtle Grove, Bingley. The old birds had been seen flying about in the neighbourhood all the previous spring, but the nest was never actually discovered. A second young one was caught, but being laid on one side was unfortunately destroyed by his cats. It was said the brood committed serious havoc amongst the fruit crops and peas in the allotments. This is the first instance I have known of the Hawfinch breeding in this district.—E. P. P. BUTTERFIELD (Wilsden).

PROBABLE OCCURRENCE OF *EMBERIZA CÆSIA* IN ENGLAND.—In 1875 a Bunting was caught at Brighton which I have hardly any doubt was an immature *Emberiza casia*. It is true that some ornithologist pronounced it to be a "melanism of the Yellowhammer;" but this was quite contrary to evidence, for, in the first place, there was no blackness about the bird at all, and, in the second place, it had not the strong beak of a Yellowhammer. The upper plumage generally was dark reddish brown, varied with blackish; rump rufous; breast tawny. The only bird that would come near the description would be *Emberiza cia*, but the white wing bars were wanting. I afterwards found an adult *Emberiza casia* at Swaysland's, which he had taken to be a variety of the Ortolan. He believes that this was caught in the neighbourhood, but is not sure. I may observe that as *E. casia* has occurred in Heligoland, it is quite as likely to be met with at Brighton as any of the other eastern species that have occurred there, such as *Emberiza rustica* and *pusilla*, *Turdus atrigularis*, &c.—CLIFTON.

NESTING OF THE TUFTED DUCK IN SCOTLAND.—At a recent meeting of the Glasgow Natural History Society, Mr. J. Long exhibited the eggs of the Tufted Duck, *Fuligula cristata*, along with the male bird, taken last summer in Perthshire. Mr. Long read a note from his friend who had taken the nest, stating it had been found on a small island under a swan's nest. The duck's nest was placed about eighteen inches down among the straw forming the larger nest. Both the male and female birds were at the nest when first observed; the drake was shot, but the duck got away wounded. Mr. Small, of Edinburgh, states that two years ago a nest was taken by Mr. Herbert in Fifeshire. He put the eggs under a hen which brought them out. Another doubtful instance of this species has been reported, but as yet there is no authentic information respecting it.—JAMES LUMSDEN (Arden House, Dumbartonshire).

[Although the nesting of the Tufted Duck in Perthshire is no doubt an occurrence of much interest to naturalists, and one well worth recording, it is to be regretted that so little respect was paid to the provisions of the Act for the protection of Wildfowl. As the species was identified, the finder of

the nest might have been content to take the eggs only, and give the parent birds a chance of rearing a second brood.—ED.]

SNIPES-CATCHING IN DORSETSHIRE.—In the last number of 'The Zoologist' (p. 134) mention is made of a Reeve caught in Dorsetshire in a "snipe-trap." Would your correspondent oblige your readers with a description of the "snipe-trap"? I have never heard of such a trap being in use at the present day, although I have heard of a drag-net being used by night to catch Snipes in Somersetshire in the marshes near Glastonbury, and once saw a Little Bittern that had been so caught in that locality.—J. H. GURNEY (Northrepps Hall, Norwich).

BULLFINCH EATING PRIVET-BERRIES.—In Withering's 'British Plants' (ed. 7, vol. ii., p. 13) we read, under his account of the privet, "The berries afford an acceptable winter food for birds, especially Bullfinches." I cannot find this statement as to the partiality of Bullfinches for these berries confirmed by any more modern writer, nor have I ever seen them feeding on them; consequently I think it worth while to ask in 'The Zoologist' if any of its numerous correspondents have any information to give on the matter.—T. R. ARCHER BRIGGS (Richmond Villa, Plymouth).

FIRECREST AND GREAT GRAY SHRIKE AT BRIGHTON.—A single Firecrest was found, killed by the telegraph-wire, in this neighbourhood last autumn. It is the only uncommon bird I can hear of, except a Great Grey Shrike. I may observe that the only specimens of these two species that I ever saw were also procured in the same season as each other; the Great Grey Shrike at Inveran, Sutherland, February 11th, 1876, and the Firecrest at Cobham, Kent, November 16th, 1876.—CLIFTON.

HAWFINCHES FLOCKING IN WINTER.—During the great snow-storm of January last a considerable flock of Hawfinches took refuge in the stack-yard at Costerton, near Blackshiels, and the farm-servants managed to snare four males and two females, which are now in the aviary at Costerton House, belonging to Mr. D. Ainslie.—WM. HORN (7, Randolph Crescent, Edinburgh).

SLAVONIAN GREBE NEAR CROMER.—On February 17th a Slavonian Grebe was killed with a stone at Siderstrand, near Cromer, as it was swimming about in a horse-pond.—J. H. GURNEY, JUN. (Northrepps, Norwich).

ALLEGED DESTRUCTION OF LARKS' EGGS BY STARLINGS.—With regard to the remarks of Mr. Service (Zool. 1878, p. 427) as to Starlings destroying Larks' eggs, I may remark that no such propensity on the part of the Starling has ever come under my observation. That these birds have multiplied excessively during the last few years, notwithstanding their

rearing but one brood in a year, is a fact apparent even to casual observers, yet there is no diminution of Larks. I find numerous Larks' nests every year in the pastures where I see Starlings busily employed all day long searching for food for their young, yet I very seldom find these nests plundered. Rooks, with which Starlings frequently associate in their foraging excursions, I verily believe are not altogether guiltless in this matter. I suspect they destroy both nests and young birds.—E. P. P. BUTTERFIELD (Wilsden).

GOOSANDER AND LITTLE GREBE IN CUMBERLAND.—On December 21st I received two Goosanders, male and female, in splendid condition, which had been shot on the River Derwent on the 20th by one of Sir Wilfrid Lawson's keepers. A pair was seen upon the River Cocker the same day; the female was shot by Mr. Robert Mitchell, station-master at Cockermouth. I had a Little Grebe, shot out of four or five upon Bassenthwaite Lake. I hear of very few rare birds having been shot near here. — GEORGE MAWSON (Moorside, Cockermouth).

FERRUGINOUS DUCK IN DORSETSHIRE.—A specimen of this duck, *Nyroca ferruginea* (Gmelin), was shot on the Wareham River in January last. So far as I am aware, this is the first instance in which it has been met with in Dorsetshire.—J. C. MANSEL-PLEYDELL (Whatcombe, Blandford).

WRENS ROOSTING IN VACANT NESTS OF HOUSE MARTINS.—In connection with Mr. Tomlinson's observations on a roosting habit of the Wren (p. 135), it may be worth while to mention that during a period of excessive cold I have noticed Wrens coming in numbers, night after night, to roost together in the vacant nests of the House Martin.—T. R. ARCHER BRIGGS (Richmond Villa, Plymouth).

WINTER VISITANTS AT HARWICH.—During the months of October and November last large flocks of Snow Buntings frequented the Dovercourt and Walton shores, and many of them were shot. On the 3rd December a Little Auk was picked up alive on the deck of one of the Great Eastern Railway Company's steamers whilst lying alongside the pier. An immature specimen of the Little Gull was shot on the Dovercourt beach on January 10th, and a Lesser Spotted Woodpecker at Ramsey on the 2nd February. The Woodpecker is very rare here.—F. KERRY (Harwich.)

RARE BIRDS IN THE ISLE OF WIGHT.—In the January number of 'The Zoologist' (p. 32), the Editor quotes Mr. A. G. More's statement in Venables's 'Guide to the Isle of Wight,' to show that the Honey Buzzard has been procured in the Island. It would have been more satisfactory had Mr. More stated when, where, and by whom it was shot. The Honey Buzzard is set down in his list as an occasional visitant! and the White-

winged Crossbill is included, though only "supposed to have once occurred." As to that mysterious bird the Great Black Woodpecker, shot at Shanklin, I should like to know what became of it. Latham, if I mistake not, was the first to note its appearance in Britain, having heard of its being "occasionally seen." But Yarrell cites no less than twelve instances of its being killed—*pour encourager les autres*? A Hoopoe, shot by my father (the first recorded instance of its occurrence in the Isle of Wight) at Bonchurch sixty-five years ago, and which I saw in the flesh, can be traced and seen, too, having been—on the sale of Mr. Bullock's fine collection—transferred to the British Museum.—HENRY HADFIELD (High Cliff, Ventnor, Isle of Wight).

CORONELLA LEVIS IN DORSETSHIRE.—I do not think this snake is likely to be found in any part of the Vale of Blackmore (Zool. 1878, p. 462), where the cold clayey soil is unsuitable to its habits. It has hitherto only been observed on the sandy heaths of our coast, and there only rarely, although its resemblance to the Viper may have led to its being unnoticed as a distinct species. It is distinguished from that reptile, not only by the absence of poisonous fangs, but by a different ornamentation on the neck, having two longitudinal rows of dark spots instead of the costal lozenge-shaped streak.—J. C. MANSEL-PLEYDELL (Whatcombe, Dorsetshire).

OCCURRENCE OF THE RED BAND-FISH, *Cepola rubescens* (Linn.), AT EXMOUTH.—On February 22nd a fisherman brought me a nice specimen of this rare and curious fish, which he had captured the previous day close to the shore at Exmouth, near the bathing-machines. He says it was in pursuit of sprats. Its gape is very wide for the size of the head, but the slender curved teeth do not seem fitted for the capture of such prey as fishes, and the abdominal cavity does not occupy more than three inches in length of the body, which is only an inch wide at its deepest part. The large swimming-bladder is quite visible through the sides when the fish is held between the eye and the light. The general colour of the fish is orange-red, deepest on the head and back, very pale on the sides, and almost white on the belly. There is a red spot on the dorsal fin at its widest part, an inch behind the head. The pectoral fins are quite colourless and transparent. There is an irregular black spot concealed between the inter-maxillary and the maxillary on each side. The total length of the specimen is nineteen inches and a half. The caudal fin terminates in a delicate filament. Colonel Montagu made this fish known as a British species, he having obtained two specimens in Salcombe Bay, Devon; one in February and the other in March, 1803. The late Mr. F. W. L. Ross mentions an individual having been taken at Powderham, on the Exe, on March 6th,

1838, which was twenty-two inches in length. Many specimens were washed up on the coast of South Devon about that time, and many on the 14th February, 1839. Two dried specimens that formed part of the Ross Collection, now in this Museum, were probably obtained at that time. It has also occurred a few times since at Kingsbridge, Teignmouth, &c. Couch says it is not uncommon on the coast of Cornwall; but it is certainly very rare on the coast of Devon, for this is the first I have obtained. Nearly all the specimens recorded appear to have occurred in February and March.—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

CORRECTION OF ERROR.—In my remarks on the Roedeer in Dorsetshire, at p. 121, seventeenth line from the top, for "Houghton" read "Ilsington."—J. C. MANSEL-PLYDELL (Whatcombe, Blandford).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 20, 1879.—Prof. ALLMAN, F.R.S., President, in the chair.

The following gentlemen were balloted for and elected Fellows of the Society:—Mr. Edward A. Fitch (Maldon, Essex); Mr. Laurence Scott (Harewood Square, N.W.); and Mr. William Stone (St. Peter's College, Cambridge).

A series of rare birds were exhibited and commented on by Mr. R. Bowdler Sharpe. Among the more interesting forms from New Guinea were beautiful skins of *Paradisæa Raggiana*, both male and female, collected by the Rev. Mr. Lawes. Of other birds from the Fijis, and obtained by Baron A. von Hügel, were species of the genus *Pinarolestes*, which also are found on Tutucla, one of the group of the Samoan Islands.

The papers read and other exhibitions at this meeting bore chiefly on botanical subjects.

March 6, 1879.—WILLIAM CARRUTHERS, Esq., F.R.S., Vice-President, in the chair.

Prof. Joseph Reay Greene, Dr. Paul Henry Stokoe, Mr. Robert Johnston (Tasmania), Mr. B. S. Williams, and Prof. J. Wood-Mason were elected Fellows of the Society.

Mr. Thomas Christie exhibited the *os sepia* of a small rare species of Cuttle-fish from Australia, collected by Dr. Bancroft. Mr. Arthur W. Waters also showed, under the microscope, and explained the peculiarities of a slide containing a section of *Bryzoa* penetrated by *Algæ*. This in part practically illustrated a paper entitled "Observations on Entozoic *Florideæ*

growing in living *Bryzoa* and Sponges," by Dr. P. H. Renisch. The latter, however, dealt with the subject more from a botanical than zoological point of view. Mr. Waters remarked that Dr. Renisch rather referred to examples of Hydroida than true Polyzoa. Prof. Duncan, in a brief *resumé* of the points at issue and of what was known generally on the subject of the parasitism in question, referred to a number of corals so affected, and stated that many of the fossil forms bore evidence of filaments penetrating their calcareous structures.

The Secretary read, in the absence of the author, a paper "On the Classification of the Maioid Crustacea, or *Oxyrhyncha*," by Mr. Edward J. Miers. The Maioid Crabs have been placed by nearly all carcinologists at the head of the *Brachyura*, from the high degree evinced in their sensory organs and nervous system, and the group, moreover, is interesting on account of the variety of their types. Exteriorly they are distinguished by their more or less elongated carapace, an anteriorly narrow large epistoma, longitudinal antennules and situation of basal antennule joint. Their buccal cavity is quadrate; the branchiæ are nine on each side, the afferent canal opening in front of the anterior legs, and the efferent at the sides of the buccal cavity; while the male genital appendages arise from the bases of the fifth pair of ambulatory legs. Though closely related to the *Oxystomata*, the *Oxyrhyncha* differ from them in their triangulate buccal cavity and position of afferent branchial channel; but *Mesorhæa* approximates on the part of the *Parthenopidæ* to the Oxystomatous type. From the Cancroid Crabs (*Cyclometopa*) typical *Maiidæ* are distinguished by longitudinal antennules and position of basal antennule joint; the *Parthenopidæ*, however, occupying an intermediate place between the rest of the *Oxyrhyncha* and certain *Cancroidea*. The author summarized and reviewed the various classifications of Milne-Edwards (1834), De Haan (1839), Dana (1851-2), Alphonse Milne-Edwards (1860), Stimpson (1870), and Claus (1876), partly adopting the first and second primary groups of Dana, but with considerable modifications. His synoptical arrangement comprises (with short diagnostic characters) 4 families, 12 subfamilies, 106 genera, and 14 subgenera, the characters of the families being thus defined:—

Fam. I. INACHIDÆ. Eyes non-retractile or retractile against the sides of the carapace. No defined orbits exist, but there is often a well-developed præocular and postocular spine. Basal joint of antennæ usually slender, sometimes moderately enlarged.

Fam. II. MAIIDÆ. Eyes retractile within the orbits, which are distinctly defined, but often more or less incomplete below or marked with open fissures in their upper and lower margins. Basal antennal joint always more or less enlarged.

Fam. III. PERICERIDÆ. Eyes retractile within the small circular and well-defined orbits, which are never incomplete as in the *Maiidæ*. Basal

antennal joint well developed and constituting the greater portion of the inferior wall of orbit; this joint is usually very considerably enlarged.

Fam. IV. PARTHENOPIDÆ. Eyes usually retractile within the small circular and well-defined orbits. The inferior wall of the orbit is continued to within a very short distance of the front. The antennæ are very slender, the basal joint does not, as in the *Periceridæ*, constitute a great part of the inferior orbital margin, but is very small and usually does not reach to the front, and with the next joint occupies the narrow hiatus intervening between the front and inner orbital angle.

March 20, 1879.—WILLIAM CARRUTHERS, Esq., F.R.S., Vice-President, in the chair.

The Rev. G. E. Commerford Casey was elected a Fellow of the Society.

A paper by Mr. Frederick Smith, "On new Aculeate Hymenoptera from the Sandwich Islands, collected by the Rev. T. Blackburn," was read by the Secretary. The author considered the general aspect of the series to be North American, with admixture of a few South-American-like forms. The ants are most diverse in character, some being cosmopolitan in range. The house ant of Madeira is common, and the little European ant (*Ponera contracta*) unexpectedly turns up here.

Mr. R. Bowdler Sharpe read the fifth of his series of contributions to the Ornithology of New Guinea, namely, "On recent Collections from the Neighbourhood of Port Moresby." This interesting collection was obtained by Mr. Kendal Broadbent, and usefully compares with those previously got by Signor Albertis from the neighbourhood of the Fly River. A Parrot of the genus *Aprosmictus* closely resembles one from the Fly River, but nevertheless is specifically distinct, offering thus a parallel case to the Crowned Pigeons, *Goura Albertisi*, inhabiting Port Moresby, and, on the other hand, *G. Selateri*, found on the Fly River. So far as is at present known, it appears that the affinities of the South Eastern New Guinea species seem to be with those of Australia, a few only veering to those of the Aru Islands.—J MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

March 4, 1879.—Professor W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the preceding month, and called special attention to a Purple-crested Touracou, *Corythaix porphyreolopha*, presented by the Rev. J. A. Gould; and to a very beautiful Lizard, *Crotophytus Wislizeni*, from New Mexico, presented by Lieut.-Colonel R. Vivian.

Mr. Selater exhibited and made remarks on examples of two rare Fruit Pigeons, of the genus *Carpophaga*.

Mr. L. M. D'Albertis exhibited some new and rare birds, obtained during his recent expedition up the Fly River, New Guinea.

Prof. Newton exhibited, on behalf of Mr. J. Robinson, of Trinity Hall, Cambridge, a specimen of *Sylvia nisoria*, believed to have been killed at Cambridge many years ago.

A communication was read from Mr. L. Taczanowski, containing a list of the birds collected by Messrs. Stolzmann and Jelski in Northern Peru in 1878. Fifty-six species were enumerated, several of which were new to science.

Mr. R. Bowdler Sharpe read some notes on birds obtained on Kina-Balu Mountain, in North-Western Borneo, by the collectors of Mr. Treacher, amongst which were several species new to science.

Mr. F. Jeffrey Bell read the first portion of some observations on the characters of the Echinoidea. The present paper contained remarks on the species of the genus *Brissus* and on the allied forms *Meoma* and *Metalia*.

A communication was read from the late Mr. Frederick Smith, F.Z.S., containing the descriptions of new species of Hymenoptera from Central America.

A communication was read from Mr. W. A. Forbes, containing a synopsis of the Meliphagine genus *Myzomela*, to which were also added the descriptions of two new species.

A communication was read from the Rev. O. P. Cambridge, containing descriptions of new and little-known species of Araneidea, principally belonging to the genus *Gasterocantha*.

March 18, 1879.—Prof. ST. GEORGE MIVART, F.R.S., Vice-President, in the chair.

The Secretary called the attention of the meeting to the herd of Japanese Deer, *Cervus sika*, in the park of Viscount Powerscourt, at Powerscourt, in Ireland, now about eighty in number, and gave an account of their introduction and history, from particulars supplied to him by Lord Powerscourt.

A communication was read from Dr. G. Hartlaub, containing the description of a new species of Barn Owl from the island of Viti-levu, which he proposed to call *Strix oustaleti*.

Mr. E. R. Alston read a paper "On Female Deer with Antlers," showing that these weapons are not unfrequently abnormally developed in fertile females of certain species of *Capreolus* and *Cariacus*, and giving reasons for believing that, in the ancestral forms of deer, they were probably common to both sexes.

Mr. Selater made remarks on some of the rarer Parrots living in the Society's Gardens. The whole series of this group in the Society's Collection was stated to consist of 170 individuals belonging to 98 species.

A communication was read from Professor Garrod, containing notes on the visceral anatomy of the Tupaia of Burmah, *Tupaia Belangeri*. The cæcum coli in this animal was stated to be small, whilst in a specimen of *T. tana* it was ascertained to be wholly wanting.

A second communication from Prof. Garrod contained notes on the anatomy of *Helictis subaurantiaca*, in the course of which he showed that the hippocampal gyrus of the brain is partly superficial in this animal, which is not the case in any other carnivorous animal yet recorded.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

March 5, 1879.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the chair.

Before proceeding to the business of the evening, Mr. Dunning said that it was his melancholy duty to announce the death of Mr. Frederick Smith, one of the Vice-Presidents of the Society, who had only at the preceding meeting been re-appointed to that office. He died on the 16th of February, at the ripe age of seventy-three. Appointed Curator in 1843, elected a Member in 1850, President in 1862 and 1863, Mr. Smith had throughout been one of our most useful associates. A constant attendant at our meetings, his readiness to communicate his knowledge to others was unfailing, and what he did communicate was not second-hand information, but was almost invariably the result of his own personal observation. His entomological work in connection with the British Museum was known to all, and to his colleagues in that institution his loss would be irreparable. For a whole generation he has occupied the position of *the* British Hymenopterist, and in his knowledge of our indigenous species, and acquaintance with their habits, he stood without a rival. Retiring and unassuming in manner, he possessed a quiet sense of humour, and amidst the warmth and unrestraint of a social gathering exhibited a capacity for entertaining others which was probably unsuspected by many who knew him only in this room. Blameless in private life, a conscientious public servant, earnest and laboriously painstaking in his work, Frederick Smith had gained the esteem of all, and the Chairman felt that he was truly interpreting the feelings of others when he said that the Society had lost a valuable Member and his colleagues a faithful friend.

Donations to the Library were then announced, and thanks voted to the donors.

M. Ch. Brogniart, of the Musée d'Histoire Naturelle, 57, Rue Cuvier, Paris, was ballotted for and elected a Foreign Member.

Mr. John T. Harris, of Newton Road, Burton-on-Trent, was ballotted for and elected a Subscriber.

Sir Sidney Saunders exhibited a series of bees belonging to the genus

Halictus from Greece. Among them were some remarkable new forms of the males.

Mr. Wood-Mason made some observations on the supposed stridulation of *Mantis religiosa*, referred to at the last meeting.

Mr. W. Cole called attention to a statement in Dr. Kerner's essay "On Flowers and their unbidden Guests," respecting the cause of blossoms being as a general rule untouched by caterpillars. Dr. Kerner presumes that flowers contain certain principles distasteful to larvæ, and are so protected from their attacks. Mr. Cole suggested that the majority of caterpillars neglect flowers as food rather with a view to their own safety than because the blossoms repel them by exhibiting unwelcome taste or odours. Most larvæ find concealment among leaves and twigs which they resemble in colour and markings, and it would be to their disadvantage to wander on to brilliant flowers, where their natural protective clothing would lose its special value. Flowers can hardly be essentially distasteful to these creatures, because many species of caterpillars, and even entire genera, feed commonly on parts of the inflorescence; but in the habits and colouring of these other modes of deceiving their enemies or escaping from them can in most cases be detected.

Mr. M'Lachlan said he had pointed out long ago the fact that many larvæ varied in colour in accordance with that of the flowers on which they fed, and he was disposed to think there was something in the idea that they found protection thereby.

Mr. Meldola saw no objection to Dr. Kerner's statement, from the point of view of vegetable physiology, since it is quite possible for flowers to secrete special chemical compounds quite distinct from anything found in other parts of the plant. With regard to larvæ which feed upon flowers to which they are adapted in colour, it is not improbable that such adaptation may result from the actual presence of the colouring matter of the flower in the tissues of the larvæ, the digestive organs of which may have become modified by natural selection, so as to permit of such permeation of unaltered colouring matters. In the case of green caterpillars unaltered chlorophyl had been detected spectroscopically in the tissues.

Mr. H. J. Elwes mentioned a case of injury done to a species of *Sternbergia* by some larva feeding in the bulb. Mr. M'Lachlan suggested it was probably that of the dipterous genus *Merodon*, which is known to attack bulbs of various plants.

Dr. Sharp communicated a paper "On some Coleoptera from the Hawaiian Islands."

Mr. Peter Cameron communicated a paper "On some new or little-known British Hymenoptera."

Part V. of the 'Transactions' for 1878, containing index, title-page, &c., was on the table.—R. MELDOLA, *Hon. Sec.*

NOTICES OF NEW BOOKS.

The Birds of the Colorado Valley : a Repository of Scientific and Popular Information concerning North American Ornithology.
By ELLIOTT COUES. Part I. *Passeres to Laniidæ.*
Washington : Government Printing Office.

No other portion of the United States of equal area presents such varied surface conditions and such climatic extremes as the Valley of the Colorado. Bounded by mountain ranges of immense extent and elevation (the main chain of the Rocky Mountains on the east, the Sierra Nevadas on the west), the greater part of the country is low, hot, and arid. The temperature, rainfall, and course of the seasons in this region are alike remarkable, and so sensibly affect the animal and vegetable life that, as Dr. Hayden has expressed it, "contiguous areas of insignificant extent may differ as much in their natural productions as if they stretched over many degrees of latitude."

This great valley takes in Arizona, much of New Mexico, Utah, and Nevada, a part of the state of Colorado, and some of Southern California. Although we have not been altogether without information as regards the zoology of portions of this territory, thanks to the labours of Mr. Cassin, Dr. Woodhouse, Dr. Heerman, Messrs. Kennerly, T. C. Henry, J. G. Cooper, and other explorers, such information has been but fragmentary, and published in scattered volumes which are not always readily accessible. It has devolved on Dr. Elliott Coues to bring together in a most convenient form a *resumé* of the investigations of these different naturalists, which he has supplemented with valuable additions of his own, derived from personal observations made by him in different parts of the territory referred to.

To say that the work is thorough and exact in its nature, is to say no more than is applicable to all that emanates from the pen of Dr. Coues, who, combining the important qualifications of an observant field naturalist with an extensive acquaintance with the bibliography of his subject, is pre-eminently fitted to undertake the preparation of such a comprehensive treatise as that under consideration.

In dealing with each species in succession, the plan which he

has adopted is to give first the English name of the bird, followed by its correct scientific appellation; then a list of the various synonyms which have been bestowed by different writers. The precise *habitat* of the bird is next defined, and a short diagnosis of the species given in Latin. This is followed by a more detailed description in English of the plumage of both sexes, and of the young, and is succeeded by a very well-written account of the birds' haunts, habits, and general life-history, which naturally forms the most readable and interesting portion of each chapter.

Some idea of the magnitude of the work may be formed from the fact that only seventeen families of passerine birds are dealt with in the volume before us, and to these 565 pages are devoted; the remainder of the volume being occupied with a very useful "Bibliographical Appendix."

If the remaining families are to be worked out on the same scale, it is likely that four more volumes will be required to complete the entire work. It promises to be a very valuable contribution to the Ornithology of North America, and forms an excellent sequel to 'The Birds of the North-West,' published in 1874, by the same author, a work which, as our readers will be aware, deals with the Ornithology of the region drained by the Missouri river and its tributaries.

Wild Life in a Southern Country. By the author of 'The Gamekeeper at Home.' 8vo, pp. 387. London: Smith, Elder & Co. 1879.

IN the course of last year we took occasion to notice a very pleasantly written book entitled 'The Gamekeeper at Home,'* which we are not surprised to see has found such favour with the public as to have reached a third edition.

We have now before us another volume by the same author, who for reasons best known to himself prefers to be nameless. His chapters are arranged so as to correspond in some degree with the contour of the country described by him. Commencing at the highest spot, an ancient entrenchment on the Downs has been chosen as the starting place from whence to explore the uplands. Beneath the hill a spring breaks forth, and tracing its

* 'The Zoologist,' 1878, p. 358.

course downwards, there come the village and the hamlet. Still further the streamlet becomes a broad brook, flowing through meadows in the midst of which stands a solitary farmhouse. The house itself, the gardens and orchard are visited by various birds and animals. In the fields immediately around—in the great hedges and the copse—are numerous others, and an expedition is made to the forest. Returning to the farm again as a centre, the rookery remains to be examined, and the ways and habits of the inhabitants of the hedges. Finally come the fish and wildfowl of the brook and lake ;—finishing in the vale.

If we have one fault to find with the author it is that there is too much description in his pages and not enough incident ; but here and there we find observations of scientific value which deserve to be placed on record under an authentic signature. We will select one example. Speaking of the Redwing (p. 301), the author says :—

“One spring—it was rapidly verging on summer—I was struck day after day by hearing a loud, sweet, but unfamiliar note in a certain field. Fancying that most bird-notes were known to me, this new song naturally arrested my attention. In a little while I succeeded in tracing it to an oak tree. I got under the oak tree, and there on a bough was a Redwing singing with all its might. It should be remarked that neither Redwing nor Fieldfare sings during the winter ; they, of course, have their ‘call’ and cry of alarm, but by no stretch of courtesy could it be called a song. But this Redwing was singing—sweet and very loud, far louder than the old familiar notes of the Thrush. The note rang out clear and high, and somehow sounded strangely unfamiliar amongst English meadows and English oaks. Then, looking further and watching about the hedges there, I soon found that the bird was not alone—there were three or four pairs of Redwings in close neighbourhood, all evidently bent upon remaining to breed. To make quite sure, I shot one. Afterwards I found a nest, and had the pleasure of seeing the young birds come to maturity and fly. Nothing could be more thoroughly opposed to the usual habits of the bird. There may be other instances recorded, but what one sees oneself leaves so much deeper an impression. The summer that followed was a very fine one.”

It is instances like this that make one hesitate to dogmatise too much as to the why and wherefore of bird-ways. Yet it is just the speculation as to that why and wherefore which increases the pleasure of observing them.

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THE LAND AND FRESH-WATER MOLLUSCA OF THE MALTESE GROUP.

BY H. W. FEILDEN, F.G.S., C.M.Z.S.

WHILST resident in Malta, during 1873 and 1874, I paid considerable attention to the land and fresh-water shells of that island and Gozo. The number of species included in this list is comparatively small; but two species of *Helix*—*H. melitensis*, Fèrrusac, and *H. Spratti*, Pfeiffer—are supposed to be peculiar to the group. Two species of *Clausilia*, the one confined to an area of a few acres in the island of Malta, the other almost equally local in Gozo, are extremely interesting on this account. The species of *Paludina* and *Physa* found in Malta and Gozo have been accorded specific rank by Professor Benoit.

Several species of land-shells not included in this list have been recorded as natives of Malta, but on insufficient authority. In the autumn of 1874, after a long continuation of rainy weather and north-west winds, I found great numbers of land-shells, certainly not indigenous to Malta, stranded in sheltered coves along the coast facing the island of Sicily. On examination they proved to be all dead shells, plugged at the mouth with a tenacious blue clay, which converted them into floats. These had doubtless been washed down by the flooded rivers of Sicily, and discharged in vast numbers into the Mediterranean Sea. The prevalent north-west winds had wafted them, along with fragments of pumice-stone and broken reeds, to the coast of Malta. As in some spots I picked up hundreds of these shells in the course of

an hour, it is evident that countless numbers must annually be discharged into the sea. Whilst floating on the surface of the waves, the continuous motion of the water must in many cases remove the plug of clay, causing the shell to lose its buoyancy and sink to the bottom. In consequence the bed of the Mediterranean, for many miles to the southward of Sicily, is in all probability scattered over with the land-shells of that island, and a mixture of land and marine forms is being deposited at great depths. I forwarded a series of these drifted shells to Professor Luigi Benoit, who most courteously examined them, and informed me that they were common Sicilian species. Among the more abundant forms were *Helix elata* (var. *turrita*), Phil., *Pupa dolium*, Drap., *Helix acuta*, Müller, *H. gregaria*, Ziegler, *H. sequenziana*, Benoit, and *Clausilia adelina*, Benoit.

Dead specimens of *Helix lactea* are sometimes found along the shores of the Quarantine Harbour of Valetta. This species is not indigenous, but is thrown overboard from the small craft that trade between Africa and Malta. The crews of these vessels use this snail as an article of food. I am indebted to Mr. Charles A. Wright, so well known in connection with the Ornithology of the Maltese group, for this observation.

In the year 1867 Dr. A. A. Caruana, Secretary to the University of Malta, read before the Society of Archæology, History, and Natural Sciences of that island a report* on the Maltese Mollusca, prepared from the MSS. and collections of the late Mr. Giuseppe Mamo, who for nearly half a century was a sedulous cultivator of the science of Conchology, and a careful collector of the Mollusca of his native islands. The catalogue prepared by Dr. Caruana from the MSS. of Mr. Mamo is extremely useful to the student of Maltese Mollusca; but several of the names given are merely synonyms, and some species, such as *Helix turrita*, Phil., and *Pupa polyodon*, Drap., have been admitted to the list on insufficient grounds. A great assistance to the Maltese student is the local collection deposited in the Public Library of Valetta by Mr. Mamo in 1854, at the instigation of Sir William Reid, then Governor of the island.

A very interesting pamphlet, entitled 'Dei Molluschi terrestri e d'acqua dolce raccolti nello Arcipelago di Malta,' was published

* Enumeratio ordinata Molluscorum Gaulo-Melitensium of the late Mr. Giuseppe Mamo. By A. A. Caruana. Malta, 1867.

by Signor A. Issel in 1868. Forty-four species are enumerated, of which thirty are considered by him as common to Malta and Sicily, three are found on other parts of the Mediterranean coast, seven peculiar to Malta, and four uncertain. The species in this list, and not in the following, are *Zonites lucidus*, Drap., *Z. crystallinus*, Müller, *Helix profuga*, Schmidt, *H. variabilis*, Drap., *Bythinia similis*, Drap., *Hydrobia musaensis*, Frauenfeld, *Melania tuberculata*, Müller, *Limnæa peregra*, Müller, and *Planorbis subangulatus*, Philippi.

Professor Benoit and Dr. Gulia published in 'Il Barth'* for 1872 the first portion of a more critical list of the Maltese Mollusca. It is to be hoped that these gentlemen may continue the publication. The land and fresh-water species included in this contribution to the Maltese fauna consists of fifteen species of *Helix* — *H. aperta*, Born., *H. aspersa*, Müller, *H. calcarata*, Benoit, *H. candidissima*, Drap., *H. cellaria*, Müller, *H. cespitum*, Müller, *H. pyramidata*, Drap., *H. conoidea*, Drap., *H. conspurcata*, Drap., *H. lenticula*, Fèr., *H. melitensis*, Fèr., *H. pisana*, Müller, *H. striata*, Drap., *H. Schembri*, Sch., *H. vermiculata*, Linn.; four species of *Bulimus* — *B. acutus*, Brugh., *B. decollatus*, Brugh., *B. folliculus*, Calcara, *B. pupa*, Brugh.; two of *Clausilia* — *C. syracusana*, Phil., *C. bidens*, Linn.; *Physa melitensis*, Benoit; *Auricula myosotis*, Drap.; and *Cyclostoma melitense*, Sowb.

The collection of terrestrial and fresh-water Mollusca from the Maltese group, on which the accompanying list was based, having been deposited by me in the British Museum, was examined by Mr. Edgar A. Smith, of the Zoological Department of that institution. I am much indebted to that gentleman for having looked over the manuscript and revised the synonymy, and for having brought to my notice Signor Issel's above-mentioned pamphlet, which contains the names of several species not included amongst those I met with in the Maltese group, after a searching examination extending over eighteen months. Signor Issel's list having been compiled in part from the collection now exhibited in the Public Library, Valetta, and from previous publications, and not altogether from personal investigation, is my reason for publishing what I believe to be a complete and exhaustive catalogue of the group. Types of all the species found by me

* "Fauna Maltese. Indice Molluschi Terrestri ed Acquatici. Benoit e Gulia," 'Il Barth,' pp. 198—200, Malta, 1872.

living in Malta and Gozo, and here enumerated, are deposited in the British Museum, and no confusion therefore need arise should additional species, which I may have overlooked, come to hand at some future time.

Genus PISIDIUM.

P. fontinale? (*Cyclas*), Drap.—Included on the authority of Dr. Caruana's and Issel's lists as found in stagnant water at the Marsa and in fountains. Though I have found the species referred to during my residence in Malta, I am sorry to say that no specimens are now in my collection.

Genus CYCLOSTOMA.

Cyclostoma melitense, Sowb.—Very common both in Malta and Gozo. A variety with a deep lilac-coloured shell, banded with white, is frequently met with.

Genus PALUDINA?

Paludina? (*Amnicola?*) *melitensis*, Benoit.—This small species of *Paludina* is met with in most of the streams, wells, and old aqueducts of the islands.

Genus LIMAX.

Three species of *Limax* are included in Dr. Caruana's list, viz., *L. variegatus*, Drap., *L. nigricans?* Schultz, and *L. gagates*, Drap. The species of slugs collected by me in Malta, from not having been properly preserved in spirits at the time, are not now to be identified.

Genus HELIX.

H. aperta, Born.—Very common both in Malta and Gozo.

H. aspersa, Müller.—Abundant, more especially in gardens; it is largely consumed by the natives as an article of food. I have partaken of this species cooked in various ways, but do not consider it palatable.

H. Schembrii, Scacchi (*H. calcarata*, Benoit).—Very common, especially by the borders of the sea. This species is liable to be confounded with *H. pyramidata*, Drap., by a casual observer; the difference in the size of the umbilicus will, however, at once separate the two species.

H. pyramidata, Drap.—Very common. A variety found by me on Filfla, an islet on the south side of Malta, has much larger shells than the ordinary Maltese type.

H. Spratti, Pfeiffer (*H. gaulitana*, Marno; *H. solaroides*, Gulia).—This species of *Helix* was first found by Admiral Spratt at Marsa-el-Farn, in Gozo, in 1843. It is not uncommon along the borders of the sea, at the spot where it was first discovered in Gozo.

H. meda, Porro.—This snail is very common on shrubs in the Floriana Gardens, near Valetta. As it is not found anywhere else in the island, the species has doubtless been imported along with foreign plants.

H. trochoides, var., Poiret = *conica*, Drap.—Included by Benoit and Gulia in their Catalogue of Maltese Mollusca, as found at Melleha and Puales, and noted as rare. The term "local" should be applied to this species, for though I have only found it on the sea-board at the head of Melleha Bay, it is there extremely abundant. During the heat of summer the animal attaches itself by adhesion of the epiphragm to plants and stones, and is to be found clustering in hundreds on the stems of *Ononis ramosissima*, Desf., and to the stalks of *Festuca elatior*, Linn. The specimens are not of the typical form of the species, and possibly may constitute a distinct variety.

H. striata, Drap.—A very common species in uncultivated spots.

H. candidissima, Drap.—This is a very common species along the sea-board from St. George's Bay to Marfra, in the island of Malta; it is equally so on the islands of Comino and Filfla.

H. melitensis, Fèrrusac.—This handsome species is spread over the island of Malta. I have very often found it on the branches of the carob-tree (*Ceratonia siliqua*), where it seeks refuge from the intense heat of summer.

H. vermiculata, Linn.—One of the most abundant land-shells. Extremely variable in colour.

H. pisana, Müller.—Most abundant.

H. cespitum, Müller.—Common in gardens and cultivated fields.

H. conspurcata, Drap.—Common.

H. lenticula, Fèr.—Not uncommon in shady and damp places.

H. cellaria, Müller.—One of the more uncommon land-shells of Malta; found under stones in damp and shady spots.

H. Erdelii, Roth.—Not common.

Genus CLAUSILIA.

C. syracusana, Philippi = *C. macrostoma*, Cantraine.—Very common, with many varieties differing from one another in the character of the striation of their shells. This is also abundant in Gozo, Comino, and Filfla.

C. bidens, Linn. = *C. papillaris*, Müller.—Very common, both in Malta and Gozo.

C. scalaris, Pfeiffer = *C. delicatæ*, Gulia; *C. scalaris*, Caruana.—This beautiful *Clausilia*, peculiar to the island of Malta, appears to have been first discovered by Admiral Spratt, near St. Paul's Bay, and was first described by Pfeiffer and again by Dr. Gulia.* The habitat of this *Clausilia* is very restricted. I found it on the Upper Limestone, along the western shore of St. Paul's Bay, from nearly opposite Selmun Island, to the little cove of Cala Mistra, extending inland to the borders of a line of fault, which, extending N.N.E. and S.S.W., exposes the marl and underlying calcareous sandstone. I was unable to trace this *Clausilia* beyond the line of fault, and it would appear that the exposure of the lower beds has acted as a barrier to the extension of the species inland. In the limited area occupied by *C. scalaris* I did not obtain specimens of *C. syracusana*, Cantraine, so widely diffused over Malta and Gozo.

C. mamotica, Gulia.—This species, described by Dr. Gulia† in 1861, and subsequently, under the same name, by Dr. Caruana in 1867, is confined to a limited area in the island of Gozo—namely, on the left side of the gorge of Sclendi.

Genus PLANORBIS.

P. ——— species?—This small species is found in the reservoir in the Floriana Gardens, in the aqueduct leading to Valetta, in a stream near Selmun Palace, in the watercourse of the gorge of Sclendi in Gozo, and in most places throughout the islands where there is a perennial supply of water.

* 'Tentamen Ichthyologiæ Melitensis,' Malta, 1861, p. 7.

† *Op. cit.*, p. 8.

Genus ANCYLUS.

Ancylus fluviatilis, Drap.—Found in streams, aqueducts and fountains.

Genus LIMNEUS.

L. (perhaps a variety of *L. truncatula*).—Found in streams and aqueducts.

Genus PHYSA.

P. melitensis, Benoit.—Abundant in a reservoir in Floriana Gardens.

Genus ACICULA.

A. acicula, Müller.—Not a common species in Malta; it is found in small numbers on the old line of fortification near Corradino, Valetta.

Genus AZECA.

A. follicula, Gmel.—Common in damp or shady places.

Genus BULIMUS.

B. decollatus, Linn.—Abundant throughout the islands.

B. acutus, Linn.—Abundant.

B. pupa, Linn.—Very common.

Genus PUPA.

P. granum, Drap.—Common in Malta and Gozo.

Genus ALEXIA.

A. myosotis, Drap.—Common in damp and uncultivated spots near the sea.

Genus MARINULA.

M. forminii, Pay.—It is with some hesitation that I include this species amongst the land and fresh-water species. I have found the shell with the animal on the sea-shore, but under circumstances that led me to believe that it had been thrown up from the sea by the waves.

NOTES FROM AN ARCTIC JOURNAL.

BY H. W. FEILDEN, F.G.S., C.M.Z.S.

(Concluded from p. 170.)

We managed, after several futile attempts, to escape from Dobbin Bay on the 3rd September; by the 4th we had rounded Cape Hawks, and were moored to the ice in Allman Bay. Our prospects at this date were somewhat critical; at least fifty miles of ice separated us from Cape Sabine, which was the most northern position where we could hope to meet with the "North water" of Baffin Bay; the stock of steaming coal was reduced to three tons on board the 'Alert,' and to two on board our consort; after that we should, if we continued our attempt to force the ice, have to encroach on our cooking and warming supply. The question, therefore, became a very serious one for our leader, whether we should at once go into winter-quarters or run the risk of drawing upon the winter fuel for steaming purposes. He decided, however, to push on for a few days longer.

On the 6th September our ships were embayed in the ice off Cape D'Urville, which marks the southern entrance to Allman Bay. Landing with Captain Nares and Markham, we walked along the ice-foot for three or four miles to the southward. The recently fallen snow, which lay to the depth of four or five inches, crackled under our feet. The sun shone out, but light clouds travelling rapidly from the westward gave a decided warning of approaching wind, and a prospect of a disruption in the ice, which then closely hemmed us in.

The cliffs under which we then travelled are composed of a massive red-coloured conglomerate; the constituent pebbles were falling in a continuous shower from the face of the cliff. Some of them were as large as a man's head, but dwindled down to the size of hazel-nuts. In some of these pebbles I detected the remains of corals, showing that this enormous thickness of water-worn conglomerates had been derived from older fossiliferous strata. During our walk we captured two Lemmings, and saw three Eider Ducks with their broods in a tidal-crack; also two Seals, *Phoca hispida*.

In the evening, the wind rising, the ice slackened, and under a full head of steam we pushed into Franklin Pierce Bay. A fine

Walrus, lying on a piece of ice, was seen. This bay appears to be a favourite resort for these animals, for it was here that we procured a couple, and saw several, during our visit of the preceding year. The Walrus does not appear to move farther north than Cape Frazer, the meeting place of the polar and southern tides; at that point we saw a single example.

Early in the morning of the 7th the ice slackened around us, and we steamed into a large pool of water that extended some distance along the eastern shore of Norman Lockyer Island. After tying up to an iceberg we landed on that island. The snow lay sufficiently deep to conceal the greater part of the Eskimo traces, which we knew to be abundant there. Here and there the stone walls of an unroofed dwelling were to be seen, and numerous skulls of Walrus, all of which had been broken for the purpose of extracting the tusks and brains. During our walk on Norman Lockyer Island I saw two Ptarmigan and a pair of Ravens, and Mr. Giffard shot eight Eider Ducks.

The whole of the 8th was spent in a wearisome conflict with the ice, that stretched as a close pack between Franklin Pierce Bay and Victoria Head to the southward. Though every exertion was made, and the vessels constantly rammed at full speed against any portions of the barrier that showed signs of weakness or offered a lead, still our progress was lamentably slow, and by midnight we were fast in the pack about two miles from Victoria Head, with every prospect of the ships being nipped. During the middle watch a Fox which came alongside was shot by Mr. Parr; it was a female, with the fur just changing into its winter colour.

Early in the morning of the 9th, by one of those extraordinary impulses which are so conspicuous a feature in ice-navigation, the floes slackened their pressure, and we escaped from the embraces of the pack. After getting to the southward of Victoria Head, we met with large spaces, covered by young ice of a few hours' previous growth, not more than two inches thick, through which the ships forced a way without difficulty. Great quantities of yellow diatomaceous matter was frozen in with this young ice. After passing Brevoort Island, which we were abreast of by six in the evening, we entered on comparatively open water. Our long struggles with the ice had ceased.

During our entire voyage I saw no stretch of scenery that impressed itself more forcibly on my mind than the line of coast

between Capes Sabine and Isabella. That rugged land, formed of syenitic, gneissoid and granitic rocks, was a complete contrast to the monotonous mural cliffs of gray Silurian limestone, under which we had for some time past been moving. Precipices so upright and smooth that not a wreath of snow could rest on their fronts rose black and forbidding from the water, whilst glaciers poured down on either side of them. The contrast between the black cliffs rising from the sea and the polished pinnacles of rock towering above their setting of everlasting ice, was magnificent as long as the sun shone upon them, but as evening fell shadow and mist descended on the mountains, and hid from view the shores of the channel that we had fondly hoped would have led us to the Pole.

Late in the evening of the 9th September we stopped off Cape Isabella. Captain Markham, whom I accompanied, landed and found at the cairn, erected the year before, a budget of home news, which we owed to the enterprise and gallantry of Sir Allen Young. After passing to the southward of Cape Isabella we were fairly afloat on the "North-water" of Baffin Bay.

In order to economise fuel our vessels were at once placed under sail, and in the teeth of most persistent head-winds we worked slowly to the southward. At that late season of the year the navigation of the head waters of Baffin Bay is a hazardous and disagreeable task. The nights get dark, and amidst driving storms of snow and sleet it requires great skill to avoid the icebergs and fields of broken-up pack. Fulmars and Kittiwakes were then very numerous in the "North-water." On the 17th, in lat. 73° 40' N., numbers of Little Auks were met with. On the following day flocks of Snow Buntings were seen migrating to the south.

On the 25th September we entered the harbour of Godhavn, Disco Island, and received a warm welcome from Mr. Krärup Smith, the Inspector of North Greenland. Though the little settlement of Godhavn is situated several degrees within the Arctic circle, and for more than half the year is cut off from all communication with Europe,—though its winters are intensely cold, and the sun remains below the horizon for nearly two months,—yet delicately nurtured ladies stay there, lightening their husbands' labours and banishment by their presence. And now that our good ships, by "skilful guidance led," have brought us once again to civilized homes, though buried in Arctic wilds, it seems befitting to bring to a close this brief narrative of a Polar voyage.

ON THE RING OUZEL WINTERING IN ENGLAND.

BY THE EDITOR.

THE observation of the Rev. Isaac Harding, in the last number of 'The Zoologist' (p. 174), to the effect that a pair of Ring Ouzels nested in the Malvern Hills last summer, and remained there with their young *all the winter*, is noteworthy, inasmuch as this bird is generally regarded as a summer visitor to the British Islands, arriving in April and departing in September or October. Professor Newton, in his edition of Yarrell's 'British Birds' (vol. i., p. 287), thus characterising it, adds:—"White, of Selborne, who took an especial interest in the appearance of this bird, mentions (Letter xxxviii. to Pennant) that some were seen in the Forest of Bere, on the borders of Hampshire, at Christmas, 1770, a season which had been marked by almost incessant rain from the middle of October; but the occurrence of the Ring Ouzel in winter seems otherwise unknown in Great Britain, for the information received by Pennant as to its residing in Scotland all the year round is plainly erroneous."

As I happen to have made a few notes on the occurrence of the Ring Ouzel in England during winter, the present seems a fitting opportunity for reviewing them. To begin with the oldest observation in point of date. Since the appearance of the part of the new edition of Yarrell's 'British Birds' which contains the passage above quoted (July, 1872) the correspondence between Gilbert White and Robert Marsham, of Stratton Strawless (1790—1793), has been published in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (1876, vol. ii., pp. 133—195). In this correspondence is a letter from Marsham, dated the 31st August, 1790, in which the following passage occurs:—"I find by a memorandum of mine of so old a date as Sept. 14, 1722, I shot a Ring Ouzel. This was the first my father had seen. This shows they are strangers in Norfolk. But I have seen them twice since *in severe frosts*."

Ten years ago I made the following entry in an interleaved copy of my 'Birds of Middlesex':—"Davy, the bird-catcher, in the Hampstead Road, tells me that his men bring in Ring Ouzels to him every year *up to Christmas and quite early in the*

spring, and he concludes that many at least must spend the winter here."

In December, 1874, Mr. W. E. Beckwith, of Eaton Constantine, Salop, observed a Ring Ouzel in his neighbourhood, as he subsequently informed me, his attention being attracted to it by the alarm-note, and the bird's white gorget being distinctly seen by a companion who was with him.

Mr. H. G. Okeden, of Turnworth, near Blandford, Dorsetshire, writing in February last, informed the Editor of 'The Field' that for the last two years he had remarked that a few Ring Ouzels spend the winter in his neighbourhood.

We have now the Rev. I. Harding's statement that this bird at least occasionally winters in the Malvern Hills.

It was in consequence of reports, unfortunately not always noted, of the occasional wintering of the Ring Ouzel in England, that I was induced to characterise this bird in my 'Handbook of British Birds' (p. 12) as "Resident; nesting regularly in the hilly parts of the west and north of England and throughout Scotland. In the eastern and south-eastern counties of England, a spring and autumn migrant." In other words, I was inclined to place it in the same category as the Pied Wagtail, the Meadow Pipit, and, I may add, the common Song Thrush, all of which, as we know, are to a certain extent migratory, for numbers move southward and quit the country in autumn, and yet some may always be found here during the winter. The instances of the appearance of the Ring Ouzel in winter which have since been reported rather tend to confirm this view, and since the bird has been detected here in winter in six different counties—Norfolk, Salop, Worcester, Middlesex, Hants, and Dorset—it is not unreasonable to suppose that it may have wintered unobserved in other counties also. Perhaps those individuals of the species which have gone farthest north on the spring migration do not in winter cross the English Channel or pass farther south than those counties which lie immediately to the north of it. Mr. Rodd has remarked that the Stone Curlew or Thick-knee (*Edicnemus crepitans*), which is generally met with as a summer visitor in other parts of England, is never seen in the Lizard and Land's End districts except in winter; and the only way, he thinks, to account for this deviation, is to presume that a portion of the migratory party, in their southern flight in the autumn, hold a northern

limit just reaching the Land's End and the Lizard lands (the most southern in the British Isles), the corresponding northern migration in the spring just taking the whole number above the southern latitudes of the extreme western counties.

Possibly we may have something analogous to this in the case of the Ring Ouzel. Some such idea seems to have crossed the mind of Gilbert White when penning his twentieth letter to Pennant, and his remarks in that letter on the migration of the Ring Ouzel may be here appropriately quoted. Referring to the birds of this species observed by him in spring and autumn, he remarks:—"Now perhaps these Ouzels are not the Ouzels of the North of England, but belong to the northern parts of Europe; and may retire before the excessive rigour of the frosts in those parts; and return to breed in the spring, when the cold abates. If this be the case, here is discovered a new bird of winter passage, concerning whose migrations the writers are silent; but if these birds should prove the Ouzels of the north of England, then here is a migration disclosed within our own kingdom never before remarked. It does not yet appear whether they retire beyond the bounds of our island to the south; but it is most probable that they usually do, or else one cannot suppose that they would have continued so long unnoticed in the southern counties."

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

BY JOHN GATCOMBE.

ON the 11th January, the ground being covered with snow, flocks of Sky Larks were continually coming across Plymouth Sound from the east, and going west, for which quarter they all seemed to be bound, but not nearly in such numbers as I have seen them on previous occasions during severe weather. A Slavonian Grebe, which was fishing off the sea-wall near the Devil's Point, remained until dark. Cormorants, Shags, and Razorbills were plentiful about this time, the latter in flocks, and the Stonehouse birdstuffer had received two more Common Bitterns killed in the neighbourhood; the stomachs of these I examined, and found them to contain the fur of water rats and mice, vegetable fibre, the elytra of beetles, and many small crabs.

On January 13th I remarked a pair of Slavonian Grebes in Fire-stone Bay, and both heard and saw a Greenshank flying up the Tamar—a very uncommon bird with us in winter, although a few generally visit our mud-flats during the autumn. Several adult Gannets were brought in by the Plymouth fishermen. They were captured either with baited hooks or by becoming entangled in the herring-nets off the port, where I understand they were very plentiful. A short time since an old male Black Redstart was killed by a friend of mine on the rocks near the Plymouth Citadel, and a Velvet Scoter in the Sound.

“Speckled,” or immature, Red-throated Divers became more plentiful after the cold weather had set in, and several were shot. Two “Cravat” or Canada Geese were also killed not far from Plymouth—one of them, strange to say, from a flock of ten, which number subsequently dwindled down to six; but I cannot help thinking that they were probably frozen-out birds from some ornamental water, although neither of the two killed showed the slightest traces of confinement. Wild Geese of several kinds were, I understand, also seen in the same locality.

The pair of Slavonian Grebes mentioned above were subsequently shot and brought to a birdstuffer, who allowed me to examine their stomachs, which were like balls, completely crammed with the remains of small silvery fish, shrimps, and, I believe, sandhoppers, mixed up with an immense quantity of down, shafts, barbs, fibres, and many whole feathers from their own bodies. I have often been struck with a habit the Grebes—particularly the Crested species—have, when on the water, of suddenly erecting and shaking the plumage of the back, just in the manner of a bird after having charged its plumage with dust.

Great Black-backed Gulls, about this date, became numerous, but, notwithstanding the extremely severe weather, I did not observe a single Glaucous or Iceland Gull the whole winter. Many authors, when describing the colour of the bill of the Great Black-backed Gull, say that the projecting angle of the lower mandible is red, or orange, with a black spot in the middle. This black spot, however, is not always present, especially in the breeding season, nor even does it appear on the bills of perfectly adult birds in winter, and is more or less a sign of youth, according to its extent. On examining a fine adult Great Black-backed Gull in January I found that the spot on the angle of the

lower mandible was of a pure and vivid orange-red, without a trace of the dark spot.

Two immature Red-throated Divers were brought to a Stonehouse birdstuffer on February 1st, and on the same day I observed six Northern Divers swimming and diving very near each other in Plymouth Sound. I am glad to add that Red-throated Divers are now becoming more numerous than they have been for some years past. After severe winters they used formerly to appear sometimes in great numbers, and on such occasions many remained on our coasts until they had assumed their full breeding plumage, although they usually leave us before that time. Several Goldeneyes and Scaups were to be seen in the markets at this date.

On February 4th seven Herons, large flocks of Gulls (*Larus ridibundus*), Lapwings, and Curlews were congregated on Chelson Meadow, near the banks of the Laira. After the severe weather set in, Kingfishers disappeared. Razorbills were then very numerous in the Sound, although none, so far as I could observe, showed any signs of assuming the breeding dress. Two immature Black-throated Divers were killed, one on the St. Germain's River, and the other, I believe, in the Sound. I have never yet seen or heard of an adult bird of this species having been obtained near Plymouth, and the only one approaching to that state was killed many years ago by my brother near the Devil's Point, Stonehouse. The upper plumage of this bird was nearly of a uniform black or dusky, with a few square light spots just appearing on the scapulars, and the sides of the breast near the bottom of the neck beautifully striped with black and white, but without, as far as I can remember, showing any signs of the purple-black patch on the throat peculiar to old birds in the breeding season. Some Hawfinches and Bramblings, both uncommon species in this neighbourhood, were killed about this date.

The weather on the 10th February was very stormy and wet, but not cold, and a large flock of grey geese—of what species I could hardly ascertain—flew down our harbour and across the Sound towards the south. Many flocks of geese of different kinds were seen frequenting the waters and valleys near Ermington, not far from Plymouth, and several individuals were killed. On the 25th, weather bright and warm, I heard Herring Gulls uttering their spring or breeding cries.

By March 7th Chaffinches were in full song around Plymouth, and many Black-headed Gulls had already assumed the dark head. On that date I remarked some diving ducks on the Laira, but they were so far off that I could not quite make sure of the species. There were also a large number of Curlews, Dunlins, and Ringed Plovers about the mud-banks. On the 8th a Lesser Spotted Woodpecker was killed by a gamekeeper in Sheviok Wood, not far from St. Germans, the stomach of which contained small white grubs or maggots, similar to those found in oak-galls. Lesser Black-backed Gulls were plentiful in pairs, but *Larus marinus* was unusually scarce for the time of year. *Larus canus*, too, began to assemble, as it generally does just before the nesting season; but I do not know a single locality anywhere on the coasts of Devon or Cornwall within many miles of Plymouth where either this gull or the Lesser Black-backed Gull breeds, *Larus argentatus* being the only species which nests in our district. Notwithstanding severe easterly winds all the Black-headed Gulls left us for their nesting quarters, and will not return until the end of August or beginning of September. On March 29th I was much pleased to see a Glaucous Gull, apparently an adult bird, flying in the Sound, the only one of the species I had remarked all the winter.

OCCASIONAL NOTES.

STOATS ASSUMING THE ERMINE DRESS.—During the past severe winter an unusual number of Stoats in this district appear to have assumed the ermine dress, either wholly or in part. I find that the three principal bird-stuffers in Norwich have received during last winter six specimens in which the ermine dress was entirely assumed, and twenty-one in which the change was only partial, though in several of the latter it was very nearly complete.—J. H. GURNEY (Northrepps, Norwich).

STOATS IN ERMINE DRESS.—Since my last note (p. 122), three more almost perfectly white Stoats, *Mustela erminea*, have been sent to our animal preserver, making six within three months. One of these specimens was entirely white, with the exception of an extremely narrow line of brown round the eyes—indeed hardly wider than the eyelid itself.—JOHN GATCOMBE (Durnford Street, Stonehouse).

ROE-DEER IN DORSETSHIRE.—Mr. Mansel-Pleydell states (p. 121), that Mr. Drax colonized the Charborough Estate (together with the Bloxworth Woods, which are surrounded by it) in 1829, with Roe-deer from the Whatcombe district. The progeny of these, however, were completely exterminated soon after the year 1833, when Mr. Drax gave up hunting Roe-deer and took to Fox-hounds. Some years subsequently Mr. Drax again turned out, in Bere Wood and the adjoining Bloxworth Woods, some more Roe-deer, given to him by the late Baron Hambro', of Milton Abbey; and it is the produce of these latter, which are now to be seen occasionally though in rapidly diminishing numbers, in the woods of this district. The cause of their decreasing numbers is, most certainly, the thoughtless habit of sportsmen shooting at them out of range, and with too small shot, when cover-shooting in the winter months. I have myself, on more than one occasion, come across a dead Roe-deer which had evidently been hard hit with small shot, and gone away to die. Mr. Mansel-Pleydell speaks of the fecundity of the Doe, and gives its produce at a birth as "two and sometimes three fawns." In Bell's 'British Quadrupeds' (2nd ed., p. 365) the number is stated to be either "one or two."—O. P.-CAMBRIDGE (Bloxworth, Blandford, Dorset).

[Mr. W. Colquhoun, a well-known authority on such matters, writes, "Roe-deer almost invariably produce two kids."—ED.]

EXISTENCE OF THE SAIGA ANTELOPE IN FRANCE DURING THE REINDEER AGE.—It is now several years since the late M. Lartet announced the discovery of fragments of horns of the Saiga in the quaternary deposits of Perigord, belonging to the Reindeer-period. At the same time he expressed the opinion that this Antelope was not living in France at the period in question, but that its horns had been obtained from foreign sources for use as weapons by palæolithic man. The Saiga is a curious sheep-faced Antelope, which at present inhabits the steppes or open plains of Eastern Europe and Western Asia, extending from Poland through the region of the Don and the Volga, as far eastward as the Altai and the Irtysh River. It is of much interest to determine whether the distribution of this creature did or did not extend into France during post-pleiocene times. On this point M. Gaudry has recently communicated fresh information to the French Academy of Sciences, in a note "*De l'existence des Saigas en France à l'âge du Renne.*" This palæontologist has lately found among specimens from the bone-caves of Aquitaine not only the horns, but the teeth and many of the bones of the Saiga, some of which have been broken, obviously for the purpose of extracting the marrow. It seems, therefore, to be now placed beyond doubt that the Saiga lived on the borders of the Tardoire and the Vézère, contemporary with the Reindeer, and that it served as food to the prehistoric men who dwelt in the

caves and rock-shelters of the district, and who have left to us the well-known works of primitive art sculptured on bone and reindeer-antler. M. Gaudry's observations thus tend to confirm the opinion of the late M. Paul Gervais, that an engraving found by M. Piette in the Cave of Gourdon, in the Haute Garonne, really represents the head of the Saiga Antelope, copied from the living creature.—*'The Academy,' 5th April, 1879.*

MARTENS IN NORFOLK AND SUFFOLK.—I am desirous of adding a few supplementary remarks to Mr. Norgate's notice (p. 172) of the Marten which was trapped at Hevingham, Norfolk, in the summer of 1878. The animal passed into the hands of Mr. T. E. Gunn, birdstuffer, Norwich, who was good enough to allow me to see it very soon after he had mounted it in July last. It was a large male specimen of the Yellow-breasted or Pine Marten, and showed no traces of having been kept in confinement; so that, if it had escaped from captivity, it had probably been at large long enough to have lost any signs of previous imprisonment. That this specimen was an escaped one is rendered probable by the considerable length of time which had elapsed since any previous specimen of the Marten had been known to have occurred in Norfolk. An old warrener, named Brighton, who died in 1862, at the age of ninety-eight, told me that, when he was a boy, Marten-cats inhabited Brooke Wood, in Norfolk, where he was then employed, which may probably be accepted as a proof of their existence in the county about the end of the last century. Some fifty years ago, I recollect seeing a stuffed Marten in the possession of the late Mr. Postle, of Colney Hall, Norwich, and, if my memory does not deceive me, I was told that it was a Norfolk specimen. Later than this I cannot trace any Martens in Norfolk, until the occurrence of the Hevingham specimen last year; but a curious record of as many as forty-three Martens having been killed by a gamekeeper in Suffolk (together with a long list of other so-called vermin) in the year 1811, has been published in the *'Transactions of the Norfolk and Norwich Naturalist's Society'* (vol. ii., pp. 223-4), to which I would refer for further particulars. Unfortunately the exact locality in Suffolk where this occurred is not now known.—J. H. GURNEY (Northrepps, Norwich).

RABBITS SWIMMING.—We saw rather an amusing thing to-day (18th April). We caught a very little rabbit in a hedge, and let it go near the moat. It instantly set off towards the moat and jumped in. We rushed up, expecting to find it drowning, but found it had got more than half way across the moat. As soon as it reached the other side it got on to the bank and into a hole.—PROCTER S. HUTCHINSON (Inval, Haslemere).

[Rabbits when pursued will sometimes take to the water and swim boldly. One pursued by a dog leaped into the Cam at one of its greatest widths, and was swimming across, when a boat put off and captured it.—ED.]

ORNITHOLOGICAL NOTES FROM REDCAR.—The following notes, taken during the past autumn and winter, may not be uninteresting to the ornithological portion of your readers. The arrival of autumn migrants earlier than usual caused me to suppose that we should have a good season for birds, both from a naturalist's and also a sportsman's point of view. Certainly the weather of last winter was sufficiently severe, and fowl numerous enough to satisfy the keenest wildfowler, while the naturalist has had abundant opportunities for obtaining specimens of several rare northern birds and other "strangers." Turnstones were plentiful in the neighbourhood of the Tees-mouth early in the season. The first I saw was on July 2nd, a mature bird. On the 14th nine were shot by a friend of mine. Several large flocks frequented the sands and shingle on the east side of the South Gare Breakwater. On July 29th I observed a flock of Lesser Terns, ten in number, at the Tees-mouth; and at the same place, on the 31st, two immature birds. On August 7th I saw two adult specimens, and on the 14th a flock of fifteen. On August 6th a Greenshank, an immature bird, one of three seen, was shot near the Tees. These birds of late years have become extremely rare in this district. The Pigmy Curlew was more abundant than has been known for some time. On August 20th I shot a pair from a flock of six at the Tees-mouth; on the 31st two were shot on Coatham sands. Four were shot from a flock at the Tees Bay on Sept. 10th, and six were obtained at the same place during the first fortnight of the same month. Two were shot at Coatham Marsh on the 23rd, and one at the Tees-mouth on the 30th. Two Reeves, birds of the year, were shot on Coatham Marsh, one on September 10th, the other on October 1st. During the summer a large number of Gannets frequented the Tees Bay. Four adult birds were shot off Redcar in September. Early in October a Ferruginous Duck, one of a pair seen, was shot at Coatham Marsh. The number of Ducks and other fowl which passed Redcar during the autumn migration was much larger than has been known for many years. The first flights were observed about September 16th, and continued every morning for almost a month, when heavy gales came from the N.E., which lasted for more than a fortnight. During the prevalence of this storm immense numbers of fowl of various kinds, but chiefly Duck, Widgeon and Teal, passed, flying from E. to N.W. Three Goosanders and two Grebes (species not ascertained) were obtained during these gales. A large flock of Wild Geese passed over the Tees on September 18th, flying S.W. Excepting this flock, few were seen before Christmas; but since January set in several large flocks (chiefly Brent) have been constantly observed, both in the estuary of the Tees and also passing Redcar. A good many Brent Geese were obtained by the punt-gunners in the river. Several swans were shot in the neighbourhood of the Tees estuary, one being obtained on the 20th December, and another on the 5th February. On the 15th January I saw

a very fine specimen of Bewick's Swan, which had been shot in the Tees, in the hands of a Middlesborough taxidermist. On February 6th I saw four Swans, three white and one grey, on the north side of the estuary; the example which had been obtained on February 5th was shot from this herd. Several Glaucous and Iceland Gulls were shot during the winter, but chiefly immature birds. I have seen one of the Glaucous and two of the Iceland species (old birds) which were obtained near Redcar; one of the latter was shot by a friend of mine east of Redcar on December 19th. On November 21st, while off in a boat near Redcar with a friend, we shot a Black-throated Diver, a female bird, in the plumage of the second year. Several Puffins and a great many Little Auks were washed ashore during the heavy gales from the sea, killed by the violence of the waves or by starvation. I have seen at least a dozen of the latter species which were picked up dead on the beach. On the 14th and 15th November I picked up each day a Puffin and Little Auk. On the 16th I found a Puffin on Coatham sands, and on the 18th a Little Auk on the sands east of Redcar. I picked up a Little Auk on Coatham sands on the 28th, and on the same day a Puffin near Redcar. On the 23rd January a Little Auk found near Redcar, and another on the 25th. I shot two while in a boat off Tees Bay on the 27th, and saw one flying about the same time. Picked up two east of Redcar on February 5th. These little northern visitors seem to have been plentiful on the north-east coast, as reports from different places testify. Several were found in the fields near Redcar, and one in a yard near Middlesborough. The Razorbills also suffered very much from the severe weather, numbers having been found dead on the beach. During December immense flocks of Fieldfares, Redwings, and other small birds passed, flying towards the Tees. From the 9th to the 12th the flocks chiefly consisted of Redwings with a few Fieldfares, but from the 17th to the 21st the Fieldfares predominated and Redwings were comparatively few. Altogether I should say that several thousands of these two species must have passed Redcar during the fortnight they were observed. On the 12th December the sands and mudflats at the Tees-mouth were covered with Golden Plover; the next day they had almost disappeared, only a few small flocks remaining. Snipe were fairly plentiful in the water-courses and small pools of open water; they were for the most part, however, in poor condition. Woodcocks and Short-eared Owls seem to have missed us in their migration, probably crossing farther south. An Owl was shot on the South Gare Breakwater on August 31st; five more were obtained at the same place during November. I shot one on January 14th. About a dozen Woodcocks were observed. In a general way both these species visit us in considerable numbers during October and November. On the 6th February I shot a Great Northern Diver, a second year's female, near the mouth of the River Tees. An old male bird of this species was reported to

have been obtained near Redcar in October last, but not having seen the example I cannot be certain of the truth of the statement. Amongst other birds reported to have been shot, and which I have not mentioned before for the same reason, are two Red-throated Divers in summer plumage, which I am told were shot off Redcar early in September; also a Manx Shearwater on October 12th. Respecting the latter, I am pretty certain that several Shearwaters were seen by the fishermen in the offing during the summer, but I did not myself see a specimen. As an instance of the severity of the winter, I may mention that five Grouse were shot on the sand-hills near here. A curious circumstance occurred a few weeks ago. The sea rising suddenly during the night surprised a flock of ducks sitting on the water near the shore up Coatham sands; a heavy wave falling amongst the flock stunned and washed ashore several birds, which were found exhausted on the sands. I am informed that about fifteen years ago a similar incident happened, but on a much larger scale, about a hundred or more ducks being captured. In Mr. Cordeaux's notes (p. 89), he quotes from a correspondent's letter from the Fifth Buoy-light—at least I presume it is so—"A punt-shooter killed at one shot fifty Dunlins, twelve Stints (?)," &c. If Mr. Cordeaux will pardon the suggestion, I think the note of interrogation should come after the word "Dunlins," the river-shooters generally giving this name to the Knot, but a "Stint" is a Stint (*Tringa alpina*) all the year round; thus the punt-shooter's bag would be "fifty Knots, twelve Stints," &c.—J. H. NELSON (Coatham, Redcar).

WILDFOWL IN THE POOLE DISTRICT.—Although I have not been able to do much personally in the way of observation this year, the gunners have kept me pretty well informed of what has been going on. A male Ferruginous Duck was killed in Wareham Bay, just after Christmas, by Charles Orchard, one of our most successful puntsmen. [See p. 182.] It was in company with a lot of Redheads or Pochards, and was brought up to me to be identified, but, being from home, I missed the chance. Mr. Hart, of Christchurch, who preserved it, informed me that it was in very fine plumage. I have not heard of any great rarities being obtained during the severe weather of the late winter. There were not so many wildfowl in the early part of the season as one would have expected, but after Christmas a good many of the ordinary Duck, Widgeon, and Curres were killed, but no Geese. In the early part of February a number of Brent or "Bran" Geese, as we call them, came in during the prevalence of a strong east wind. They were very tame; I heard of sixty or seventy being shot by three gunners in "Son Deeps" at the mouth of the harbour. Mr. Hart has sent me a pretty good list of wildfowl which passed through his hands during the winter, including Pintail, Gadwall, Shoveller, Tufted Duck, Ferruginous Duck, Goldeneye, Merganser, Goosander, Hooper and

Bewick's Swan, White-fronted, Brent, Bernicle, and Egyptian Geese. I have not enquired into the history of the Egyptian species, but no doubt it was some escaped bird. Two winters ago we had a pair at Wareham, but their wings showed their origin at once. Last winter we had a visit from a party of Canada Geese: about twenty in number made their appearance on the low land by the river-side, in front of our window at Westport. Two of them were speedily shot, and a third fell wounded in a field and was secured after an exciting chase. I examined these birds and saw nothing in their appearance to show that they had been domesticated, but this species of goose is so often kept in a semi-wild state on private ponds and lakes that one can tell nothing from that. In the spring and early summer there were a nice lot of Curlews and Sheldrakes about the different bays and gravelly points with which our large harbour abounds; a good many nests, too, were hatched out in due season: the young "Burrow Ducks," as they are called, are, I am sorry to say, often wantonly destroyed, but a good number pull through and soon get wild enough to take care of themselves; these, curiously enough, leave us in autumn, and we see no more of them until the winter arrivals in November. Ring Plovers abound on several beaches, especially on the long low point running out from the Arne peninsula, yeleft "Patchins," "*nota quæ sedes*," for the waders, from the Dunlin to the Heron. Many a prize has alighted there, and five or six Spoonbills were once obtained there at one shot. Herons are almost becoming a nuisance from the number that annually come forth from the heronry among the fir trees on Arne Hill, the eel-pickers holding them in as bad repute almost as Shags, Gulls seem to have increased a good deal since the passing of the Act, *i. e.* the Herring Gull, which has a large breeding station between Old Harry and Swanage. In August, when the young brown ones come into the harbour, large numbers frequent the muds, especially Bran Bay at the mouth of the harbour. Besides these Herring Gulls we see only a few Black-headed ones. I have discovered two nesting haunts of this species in Dorsetshire, but only a few pairs bred in each, although large numbers frequent the harbour. There must be a large gullery somewhere near, if one knew where to look for it. Several Peregrines breed in the coast line between Old Harry and Lulworth; and the Red-legged Chough, I am happy to say, may still be seen in one or two favoured localities. The Green Cormorant, formerly quite a rare bird on our cliff, has now several stations on the same wild piece of coast line, and seems likely to become as familiar as his larger brother the Shag; a curious thing about this bird is, that it hardly ever is seen inside the harbour—it seems to prefer the open sea. I once got one inside, and that was at Stoney Island close to the mouth—a young bird in the immature plumage. The nature of our coast renders it a capital harbour of refuge to the birds; its strong tides, fierce races, and inaccessible

frontage render shooting from open boats a difficult matter.—T. M. PIKE (Westport, Wareham). [We reserve a note on the Cormorants of the Dorsetshire coast.—ED.]

ROOSTING HABITS OF THE STARLING.—I have been much interested in observing the habits of Starlings at one of their favoured roosting-places. The spot chosen is a large bed of very thick laurel and rhododendron bushes situated upon a hill, and consequently in an exposed situation, yet in close proximity to plantations of larch and fir, and I may safely say thousands of birds resorted thither for the purpose of roosting, and even up to the present date (28th March) their numbers seem little decreased, perhaps on account of the cold and changeable weather. Why such a site was chosen in preference to similar equally dense shrubberies in much more sheltered situations it is somewhat difficult to say, except that the favoured spot is more suitable for a "look out," having command of the views for miles around on every hand. During the daytime not a starling is to be seen in the neighbourhood, but as soon as evening approaches all is life and activity. First a few scattered individuals make their appearance, flying about in a leisurely manner high in the air; these are soon joined by others, some of the birds arriving by twos or threes, others in greater force, and coming from all points of the compass. Sometimes a small detached flock, on their first arrival, separates for a time from the main body; following the example of their more numerous friends, by soaring high in the air; others, again, arrive and settle upon some tall tree, as if waiting for absent members of their community; indeed the entire number seem to have but one object in view, viz., the collecting of all stragglers. This eventually is accomplished by the amalgamation of each separate group into one immense flock, which is celebrated with a great amount of twittering, and apparently very joyous behaviour on the part of the whole company. They then fly about in a rapid manner, the whole flock actuated as it were by one impulse, turning and twisting with great regularity and precision, sometimes separating for a few moments into two or three portions, only to join again and soar into the air, rising sometimes to a great height, and chasing each other in a most amusing manner. Thus the whole flock continue their flight, sometimes describing a circle of considerable dimensions, but always returning to the favoured bushes; in fact it is questionable if they ever lose sight of them, all the time uttering their peculiar note, something resembling that of the Mallard. As the darkness increases they fly more frequently over or near the bushes, when suddenly the whole flock drop like stones into the midst of them, the sound of the descent amongst the foliage being audible at a considerable distance. After some twittering and confusion, during which many apparently have to "fight for a place," the community settle

down to rest. One evening I hid myself near the spot, but the birds seemed quite aware of my presence in the neighbourhood, as that evening it was a long time before they made up their minds to settle, though they eventually did so. Almost every evening the performance I have attempted to describe was gone through, but on one occasion I noticed that each separate flock as it arrived went direct to the bushes in question, though why it was so on this particular occasion I am unable to say, except that the majority of the birds arrived later, and consequently had not sufficient light for their customary evolutions. Vast numbers of small birds roosted in the large thick rhododendron bushes in the vicinity, but in no instance did I see them join the starlings, either before or at roosting-time; in fact the behaviour of these smaller birds was different altogether. One or two would arrive and settle upon some tall tree—a poplar and a fir tree standing near each other, in a very exposed place, were always chosen; there the birds would perch in a quiet manner, waiting for their friends and relations, and seldom shifting quarters unless disturbed; in fact I have walked almost to the foot of the trees without their flying off, so listless did they seem to sit. As the shades of night closed in, they one by one flew quietly down into the bushes at no great distance; and I have been astonished at the immense number of birds which sought and found repose in the limit of a few hundred square yards.—G. B. CORBIN (Ringwood, Hants).

LITTLE STINT AND OTHER BIRDS IN SHEPPY.—In September last a friend shot a Little Stint on the “muds” near Leysdown, in Sheppy. It was not preserved, but I obtained the wings for identification. In examining a number of small birds feeding during the frost in a stack-yard I was surprised to detect a Tree Sparrow among them. In order that there should be no mistake I shot it. I mention the fact as I think it is a rare species in Kent. Grey Crows were abundant, as also were Rooks, but I saw no signs of a Black Crow. Wishing to get some of the grey ones, I procured a sheep, and, placing it a convenient distance from the sea-wall, soon saw them pulling it about. The terror of the Crows when I appeared over the wall about twenty-five yards off may be well imagined. I shot a solitary Rook also on the sheep, off which it had made a good meal. The Ringed Plovers were all gone, but there were a few Gray Plovers on the flats. I noticed four species of Gull, *viz.*, the Great Black-backed, Herring, Black-headed and Kittiwake. There were vast flocks of Curlews and Redshanks, and clouds of Dunlins; these latter looked very pretty when flying in the sun. Snipe were often to be met with; I put up a few from the “saltings,” not a common place, I believe, to find them; they prefer running dykes. There were both Moorhens and Dabchicks on the island. I came across most of our common birds. Larks were in thousands, and I shot one of a pale buff colour.—C. MATTHEW PRIOR (Bedford).

OCCURRENCE OF THE WAXWING AT BANFF.—In the middle of February—when we had all the appearance here, if we did not feel it, of living within Arctic regions—five of these birds alighted on a garden-wall in this town close to a friend of mine, who was scraping away the snow to get at some “green-meat” (chickweed) for a few home-pets he had. They came so close, chattering all the while, that my friend could have counted the red specks on their wings. As soon as he left the spot they alighted and commenced to peck about amongst the disturbed ground. The Waxwing, it appears, does not despise insects and worms when its more usual or common food is scanty, or not to be had. I remember, during a severe winter many years since, dissecting three birds of this species,—killed out of a flock which were feeding on a moss from which peat had been carted that day,—and finding in their stomachs numerous flies, beetles, and a few grubs. The five individuals above alluded to were seen two days afterwards in a small plantation near the town, feeding on the fruit of the rowan-tree or mountain ash. These berries, though then somewhat withered, were, I presume, a little more palatable to their taste than either insects or worms. But what will not man or animal eat when on the verge of starvation?—THOMAS EDWARD (Banff).

[From the severity of the past winter and the advent in various parts of the country of a considerable number of Wild Swans and other northern wildfowl, we had expected to hear of numerous captures of Waxwings. Strange to say, however, very few of these birds seem to have been observed this winter, or at least their occurrence, if they did appear, has not been reported. In the severe winter of 1866-7 these birds were so plentiful that between the 17th November and the 7th January, in Norfolk alone, one hundred and forty-four were procured, and this abundance was noticed in many other counties. During the winter of 1872-3, although not quite so numerous, a good many were procured. That winter, however, was not a severe one, and Mr. Stevenson has remarked (Zool. 1873, p. 3559) that the appearance of Waxwings on our eastern coasts during the winter months “is not due, as a rule, to the severity of the season.” With regard to the food of these birds, Mr. Southwell, of Norwich, on dissecting several specimens procured in the winter of 1872-3, found, in the stomachs of all but two, the remains of whitethorn haws; the exceptions had been feeding apparently on privet-berries, the whole intestinal canal being stained a rich purple.—ED.]

AMERICAN SUMMER DUCK (*Anas sponsa*) IN THE COUNTY OF WATERFORD.—Two males of this handsome species were shot about 1848 or 1849, in winter, on Camphire Island, in the Blackwater, by my cousin, Mr. Christopher Ussher. Young as I then was, I was interested in the occurrence at the time, and remember it. Both birds

passed through the hands of Samuel Moss, a birdstuffer at Youghal, to whom one of them was given. The other, mounted by Moss, remained in a glass case at Camphire for many years, until moths destroyed it. After seeing it there, in 1858, I described it in my notes, and on seeing afterwards, in 1859, the plate of the Summer Duck in 'Game Birds and Wild Fowl,' by B. R. Morris, I fully identified it as the species of duck then at Camphire. I may remark that I know of no place, either in this or the adjoining counties, where foreign ducks are kept in confinement. This adds to the many instances in which American birds have occurred in Ireland.—RICHARD J. USSHER (Cappagh, Cappoquin, Co. Waterford).

[The claim of this species to be included in our List of British Birds, even as a rare and accidental visitant, has not been recognised by ornithologists, the reported instances of its occurrence here having been generally founded, it is believed, on the recapture of escaped and semi-domesticated birds.—ED.]

STARLINGS REARING TWO BROODS IN A SEASON.—I observe that, in 'The Zoologist' for last month, a correspondent, writing of the Starling, remarks *en passant* that their great increase must be apparent to all, "notwithstanding their rearing but one brood in a year." Some years ago there was a discussion carried on in these and other pages, as to whether or not the Starling bred more than once in a season. I do not know the conclusion arrived at, but, after reading it, I took the trouble to watch one or two nests, and the conclusion I arrived at was that though the generality only had one brood, yet in some instances, even when the first brood was successfully raised, the cares of a second were entered into. Amongst others was a nest built in the roof of a house, which was watched with interest by the inhabitants, who saw one batch leave it, and soon after found that it was again occupied. Another nest I found contained, at the end of May, 1877, young birds just ready to leave; and it was in the same state at the same time the previous year. These flew all well, and about a fortnight after I found in the same nest three slightly-sat-upon eggs. This, I think, shows what I say, but, of course, there is the bare possibility that they may not have been the same birds.—R. M. CHRISTY (19, Buckingham Road, Brighton).

[This confirms the observations of a correspondent of 'The Field,' who, by means of a marked Starling, established the fact that this species does, at least occasionally, rear two broods in one season. See 'Zoologist,' 1876, p. 5164.—ED.]

SUGGESTIONS ON EGG-BLOWING.—I have long practised the following method of extracting the contents of eggs partially incubated, and of closing up the orifice again with the piece of shell taken from it. I first ascertain, as nearly as possible, the size of the embryo by trying the

buoyancy of the egg in water, and by viewing the light through it. A circle of suitable size is drawn on the egg, and a series of punctures are then made with a sharp needle round this circular line, close together, but not close enough to break into one another. With the point of a fine needle the included disc of shell is then slightly raised all round, and by gradually working in the point of the needle the connecting membrane is disengaged. The piece is lifted off with the needle carefully (as it is apt to crack across), and laid aside. The embryo may now be drawn out, head foremost, by a pin with a crooked point, which is inserted under its beak. When the shell has been cleansed, drained and dried, a circular piece of tissue-paper is cut, a little larger than the orifice, nicked all round like the covering of a jam-pot, and wetted on both sides with gum. It is then placed on the outer side of the little disc of shell taken from the egg, which is restored to its place in the egg-shell with the paper adhering to it, and the overlapping edges of the paper are smoothed down over the incision with the gum-brush. The tissue-paper being nearly transparent when gummed on both sides shows but little, and the symmetry of the egg is unimpaired.—R. J. USSHER (Cappagh, Cappoquin, Co. Waterford).

BLUE TIT NESTING IN THE GROUND.—That both Cole and Marsh Tits very frequently build in holes in the ground must be the experience of most field-naturalists, but for the Blue Tit to do so I believe to be of far less frequent occurrence, and I therefore mention the fact that last summer I found the nest (containing ten eggs) of this bird in a hole about a foot deep, half-way down a high bank at the side of the road close here. The only other instance that has come under my notice of this species building in the ground was recorded by me in 'The Zoologist' for 1874, p. 4034; and that produced a note from Mr. G. W. P. Moor (Zool. 1874, p. 4076) stating that he had found a nest of the Great Tit in a similar situation. It would, therefore, appear that all four species occasionally select such sites.—C. BYGRAVE WHARTON (Hounslow, Hants).

BULLFINCH EATING PRIVET-BERRIES.—In reply to Mr. Briggs's query (p. 181), I may remark that I have frequently seen the Bullfinch feeding on privet-berries. Either the Bullfinch must be a rare bird or the privet a scarce shrub in the West of England, or Mr. Briggs could hardly have failed to satisfy himself of the fact. I can confirm Mr. Withering's statement as to the partiality of the Bullfinch for these berries; and I know of no prettier sight—except, perhaps, a flock of Cedar Birds feeding on the berries of the mountain ash—than a small flock, or family party, when so engaged. Formerly it was a common—not to say numerous—species in the Undercliff, resorting to the gardens and plantations, of which it was the chief ornament. Several other birds feed on privet-berries, as the Blackcap does on elder-berries.—HENRY HADFIELD (Ventnor, Isle of Wight).

BULLFINCHES EATING PRIVET-BERRIES.—Your correspondent, Mr. Briggs, wishes to know if any one has seen the Bullfinch feeding upon privet-berries. I beg to say that I have repeatedly seen them doing so, both in this neighbourhood and elsewhere.—F. BOND (Staines).

MERLIN AND OTHER BIRDS IN MIDLOTHIAN.—On the 24th December last, whilst watching for Wood Pigeons, I shot a hawk which proved to be a hen Merlin. This bird is very rare in Midlothian. About the same time two Kingfishers were shot by some miners on Brimstone Burn. In the same month a friend of mine in Eastlothian, whilst walking through a field deep with snow, picked up a Snow Bunting, which was unable to fly; he carried it home alive, and it is now doing well in a cage with other birds.—JOHN M. SMITH (11, Wemys' Place, Edinburgh).

MONTAGU'S HARRIER NESTING IN YORKSHIRE.—Mr. Dalton, of Bingley, has shown me a pair of Montagu's Harriers and young, which were taken from a nest built on Burden Moor, in Upper Wharfedale. Although it is now some time since this nest was taken (I think in 1860), the fact seems worth recording, as I am not aware of another instance of its breeding in this Riding, although several individuals have been met with here at different times.—E. P. P. BUTTERFIELD (Wilsden).

WHITE-TAILED EAGLE IN THE LEWES.—On February 22nd I purchased in the flesh an adult female specimen of this bird, which was procured near Stornoway, Lewes. The weight was sixteen pounds and a half; extent of wings, eight feet five inches; the tail white, except a few of the outside feathers, which are slightly marked with brown.—R. W. CHASE (Birchfield, near Birmingham).

SCOTER ON THE THAMES.—On March 22nd, I received for preservation an adult male Scoter (*Oidemia nigra*), killed at Clewer Point, near here. I have always supposed the Scoter to be a salt-water species, and think the fact of its occurring so far inland is rather curious.—EDWARD CURTIS (45, Thames Street, Windsor).

GOOSANDER IN YORKSHIRE.—A pair of Goosanders were shot in Upper Wharfedale during the sharp weather in the early part of March. This is a somewhat rare species, only making its appearance in these valleys in exceptionally severe winters.—E. P. P. BUTTERFIELD (Wilsden).

OCCURRENCE OF THE DEAL-FISH ON THE BANFFSHIRE COAST.—A specimen of the Vaagmår, or Deal-fish (*Trachipterus arcticus*), a fish little known and seldom seen on our coasts, was found during the first week of April, at a place called Buckie, a fishing village about twenty miles west from the town of Banff. It is said to have been taken in a land-locked creek, or narrow inlet amongst the rocks. It was quite unknown to the fishermen and other inhabitants of the place. Having heard before I saw

it that it had been secured alive, I was in great hopes of being able to draw up something like a satisfactory description: judge my disappointment and mortification, I will not say anger, when the fish reached me, to find that it was so horribly mutilated by being hacked and stabbed with knives to deprive it of life, that it utterly baffled all powers of description, save the few meagre words which follow. Had it been the veritable sea-serpent come to swallow them all up, it could not have been more badly treated. When whole its length had been nearly four feet, breadth at centre eight inches, greatest thickness about an inch and a quarter, the rest of the body being much thinner. The dorsal fin extends the whole length, and where uninjured is over four inches in height; the pectorals and caudal are wanting. [This is at variance with the description given by Couch, vol. ii., p. 248.—ED.] The head is large, but, like the body, much compressed. There are very sharp teeth in both jaws. The colour of the body and head is of a bright and delicate silvery hue. This colouring-matter seems to have but the very slightest possible hold of the skin, for it comes off with the slightest touch, giving the finger as silvery a look as the fish. This is, I think, rather a peculiar fact, and one which I do not think I ever observed in any other species. The dorsal seems to have been of a bright red or pinkish colour, having in many places that tinge still. The lateral line, which is almost straight, is armed throughout its whole length with numerous sharp-pointed spines. The keel of the belly, too, is beset along its length, and on both sides, with small warty-like protuberances. If I might be allowed to express an opinion, from the remains I would say that it had certainly been a most beautiful specimen in the truest sense of the term. Its bright silvery lustre I must say, even in death, was most resplendent, glossy, and almost dazzling. What must be the appearance and reflection of these gems of the ocean when undulating through their watery way! Would it not be a sight worth seeing?—THOMAS EDWARD (Banff).

["Vaagmår," it appears, is the Icelandic name for this fish, whose home is in the icy portion of the northern ocean. Few instances of its occurrence on our coasts have been recorded; the last we remember to have heard of was one which was washed ashore at Thurso in July, 1877.—ED.]

BOAR-FISH ON THE DORSETSHIRE COAST.—A number of Boar-fish (*Capros aper*) were washed ashore on the sand-banks at Poole during the night of the 30th March; and as this fish is considered to be rather rare in British waters, the occurrence is worth noticing. As some of those captured were found to contain spawn, it is possible that they came to deposit their spawn on our warm sandy shore, and were washed ashore and stranded by the heavy sea which at that time prevailed in our bay; but this is only conjecture. They live, I have little doubt, amongst the rocks, and so are seldom caught in the trawl net. They are lovely little fish, measuring from five to six inches in length; their colour is pink

on the back and sides, gradually shaded off to a pearly white on the under parts. They are covered with minute but brilliantly sparkling pearl-like scales. I have tried to preserve two of them by covering them with glycerine, but their beauty is fast disappearing. I have had some cooked like soles, and find them delicious; the flesh is of a creamy whiteness and of a delicate flavour, so delicate that butter or any sauce would spoil them.—W. PENNEY (Poole, Dorset).

[This fish obtains its name from the shape of its snout, which is turned up, and capable of being considerably protruded. Couch, who gives a good description and figure of it in his 'Fishes of the British Islands' (vol. ii., p. 142), says, "It is not easy to imagine a more skilfully-constructed contrivance than this of the Boar-fish's mouth for sudden motion in the capture of the very small but nimble creatures on which it feeds."—ED.]

"THE FENLAND"—*Isicii*. Our reviewer suggested (*suprà*, pp. 71, 72) that, by this somewhat uncommon word, the Monk of Ely meant "salmon." That such is the case is the more likely since we have found that Ranulphus Higden, who died about 1360, when writing ('Polychronicon,' Rolls Ed. ii., pp. 12, 13) of the wealth of this country in fresh-water fish, says, "*Isicio potissime abundat et anguilla*"; a passage which was Englished by John of Trevisa, between 1357 and 1387, "Ther is grete plente of small fische, of samon, and of elys." It is true that an unknown writer of the fifteenth century (MS. Harl. 2261) translates the passage, "habundante in waters fulle of fische, specially of pyke and ele"; but John of Trevisa must be held a better interpreter of his contemporary than his successor of a hundred years later, who merely adopts the subsequently prevalent view that *isicius* and *esox* were cognate words. It must be remarked, however, that our reviewer's supposition that *isicii* in the 'Liber Eliensis' was a corruption of *leaxas*, or some such word, is not hereby strengthened.—ED.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

April 3, 1879.—WILLIAM CARRUTHERS, Esq., F.R.S., Vice-President, in the chair.

Mr. Ferdinand Coles (Stoke Newington), Mr. W. A. Forbes (West Wickham, Kent), and Dr. N. S. Whitney (Westminster), were elected Fellows of the Society.

Three botanical communications were read and discussed:—"Myrrh-bearing Plants," by Dr. H. Trimen; "Account of a Peat Flood in the Falklands," by Mr. A. Bailey (communicated by W. T. Thiselton Dyer); and "Notes on *Moquilea*," by Mr. John Miers.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

April 1, 1879.—Professor W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March, and called special attention to a young male of the Mule Deer of North America (*Cariacus macrotis*), presented by Dr. J. D. Caton, of Ottawa, Illinois, U.S.A.; and to a male Sumatran Rhinoceros, acquired by purchase, being the first example of this sex of the Sumatran Rhinoceros that the Society had yet acquired.

An extract was read from a letter addressed to the Secretary by Mr. Carl Bock, respecting the habits of the Mountain Antelope of Sumatra (*Capricornis sumatrensis*), of which he had obtained a living specimen, destined for the Society's collection.

Mr. J. W. Clark exhibited and made remarks on a drawing of a Dolphin, belonging to the genus *Lagenarhynchus*, which had lately been taken off Ramsgate.

Prof. Flower exhibited a coloured drawing of a young female of the common Dolphin, *Delphinus delphis*, lately taken off the coast of Cornwall, and made some observations on the published figures and geographical distribution of the species.

The Birds' eggs collected during the 'Challenger' Expedition were exhibited. The series was stated to contain about 250 eggs, belonging to fifty different species. Amongst these were eggs of the Sheath-bill, *Chionis minor*, from Kerguelen, and of the Wandering Albatross, *Diomedea exulans*, from Marion Island.

Prof. Mivart exhibited a figure of, and made remarks upon, a Kestrel with abnormal feet, in the collection of the Marquis de Wavrin, at Brussels.

Mr. R. Bowdler Sharpe read an account of the collection of birds made by Mr. F. W. Burbidge in the Sooloo Islands. A new Jungle-fowl was described as *Gallus stramineicollis*, and a new Parrot as *Tanygnathus Burbidgei*. A second communication from Mr. Bowdler Sharpe consisted of a list of the birds of the Labuan Island and its dependencies, founded principally on the collections formed during the last four years by Governor Ussher and Mr. W. H. Treacher, but including also descriptions of a large number of eggs carefully collected by Mr. Hugh Low. One new species, *Cypselus Lowi*, was described.

A communication was read from Mr. R. Collett, containing the description of a new fish of the genus *Lycodes*, from the Pacific, which he proposed to call *Lycodes pacificus*.

A communication was read from Prof. Garrod, containing an account of the variations in the trachea and tracheal muscles in the different forms of gallinaceous birds.—P. L. SOLATER, *Secretary*.

NOTICES OF NEW BOOKS.

Notes by a Naturalist on the 'Challenger'; being an Account of various Observations made during the Voyage of H.M.S. 'Challenger' round the World in the years 1872—1876. By H. N. MOSELEY, M.A., F.R.S. 8vo, pp. 606. London: Macmillan & Co. 1879.

IN one respect it is a pity that the publication of this volume has been so long delayed; for those who were once curious to learn the results of this "Voyage" have, by this time, had so many books and articles on the subject laid before them that their curiosity may now be deemed to be well nigh satisfied. In 1876, following the 'Reports' of Capts. Sir G. Nares and F. T. Thomson, we had Lord George Campbell's 'Log-Letters from the Challenger,' and in the same year Mr. Spry's 'Cruise of H.M.S. Challenger. In 1877 appeared Sir Wyville Thomson's 'Voyage,' in two volumes, and in 1878 Dr. Wild's book 'At Anchor;' while at least seventy or eighty papers on various points of interest in connection with the geology, meteorology, zoology, and botany of the voyage have been printed in the 'Transactions' and 'Proceedings' of the Royal, Linnean, Zoological, and other Societies, and in the pages of various scientific journals.

Mr. Moseley comes thus a little late into the field. Why nearly every member of the expedition should publish his individual experience and researches separately, instead of combining to produce one exhaustive and well-illustrated work, we cannot understand. A good opportunity, it seems to us, has been lost of making a valuable addition to that series of scientific voyages already published which has made famous the names of the 'Beagle,' the 'Herald,' and the 'Erebus and Terror.' As it is, readers have now to choose between a multiplicity of volumes in which, notwithstanding a difference of plan and style, there is, of necessity a good deal of sameness and repetition.

Without drawing invidious comparisons, we venture to express the opinion that Mr. Moseley's work will commend itself, more than any of the others we have named, to the readers of this journal. And this for two reasons. It is written by a professed naturalist, and it is not confined to any special branch of the

subject, but deals generally with the zoology and botany of the voyage, the formation of icebergs, the denudation of exposed ranges, the manners and customs of the various races met with, their weapons, mode of warfare, and so forth. In several respects it reminds us of Mr. Darwin's 'Naturalist's Voyage round the World,' which Mr. Moseley, very commendably, seems to have taken as his model of what such a journal should be. Leaving the details of the dredgings and deep-sea soundings, which formed the chief object of the undertaking, to be dealt with by specialists in this kind of work, Mr. Moseley records the chief incidents of the voyage, and his impressions of the places visited, while he intersperses these with numerous valuable observations on various subjects of Natural History. Among these scientific notes marine objects naturally receive a considerable share of attention; but the author's remarks appertain, in a greater degree, to the productions of the earth, and as the vessel, in the course of the three years and a half which the voyage occupied, touched at a great many out-of-the-way places, Mr. Moseley has been enabled to make many valuable additions to our knowledge of the natural history of the globe.

Upon the nesting habits of the various sea-birds which occur in such numbers on the almost inaccessible rocky islands scattered over both oceans, Mr. Moseley gives some curious information. His account of the different species of Penguins met with, notably the King Penguin (*Aptenodytes longirostris*) on Marion Island (pp. 176—179) is especially interesting. On this island was seen a flock of about thirty Sheathbills (*Chionis minor*). On one other occasion only did Mr. Moseley observe this bird congregating in numbers; but that they should thus assemble in flocks when not breeding is what might be expected from their affinity to the Plovers and Oystercatchers. The appearance of the Great Albatrosses on Marion Island while sitting on their nests on the ground must be very remarkable. From the woodcut on p. 172 they give one the idea, at a little distance, of a number of sheep scattered over a hill-side.

A curious fact was noted on Inaccessible Island, one of the Tristan da Cunha group, which shows how the habits of animals become modified, and even completely altered, by force of circumstances. The pigs on this island, although feeding on the roots of the tussock and wild celery, live mainly on birds and their

eggs, and have nearly exterminated a colony of Penguins on the south side of the island, the few birds that remain "having learnt to build in holes under stones, where the pigs cannot reach them." This is curious enough, although not an isolated case. The *Didunculus*, or Little Dodo, of Samoa, was originally a ground-nesting species, but to escape its enemies, chiefly domesticated animals introduced by Europeans, it has learnt to build in trees, and so for a time at least has escaped extinction.

It seems remarkable that there should be only one species of Penguin, *Eudyptes saltator*, at the Tristan da Cunha group, since in most localities where these birds are found several species occur. One would have expected to find some representative of the genus *Spheniscus* there, since one species, *S. magellanicus*, occurs at the Falkland Islands and Fuegia, and another, *S. demersus*, at the Cape of Good Hope, intermediate between which two points lies Tristan da Cunha. The connection between these two widely separated *Sphenisci* is wanting. Mr. Moseley suggests "it perhaps once existed at Tristan, and has perished."

The Teal of Kerguelen's Land is peculiar to that island and to the Crozets. Mr. Sharpe not long since described it as *Querquedula Eatoni*. It is somewhat larger than our common Teal, of a brown colour, with a metallic-blue streak and some little white on the wing. It is extremely abundant about Kerguelen's Land near the coast. Mr. Moseley killed twenty-seven in one day, and similar bags were frequent. Four or five guns used to bring back usually over a hundred birds. These Teal feed mainly on the fruit of the Kerguelen cabbage, and are extremely good eating. Until they have been shot at repeatedly they are very tame, and require to be almost kicked up to afford a shot. At one valley, near Three Island Harbour in Royal Sound, which had probably not been visited by man for thirty or forty years, a flock of these Teal rose about a hundred and fifty yards from the author, and, instead of going further away, flew towards him, and, alighting on the ground within forty yards of where he stood, commenced running still nearer to him, impelled apparently by curiosity. Of course many of them paid the usual penalty, for, as Mr. Moseley says, "only those who have been long at sea know what an intense craving for fresh meat is developed by a constant diet of preserved and salt food."

At p. 154, Mr. Moseley describes an Otter of which we do not

remember to have previously seen any account, although it is mentioned by name in some lists of Cape animals. Prof. Parker says nothing about it in his recently published account of the "Carnivora" in the second volume of 'Cassell's Natural History.' It is thus referred to by Mr. Moseley:—

"Amongst the animals which live on the Cape Peninsula, the Clawless Otter, *Lutra inunguis*, is worthy of mention. It is a very large Otter, twice or three times as large when full-grown as the European one. It lives about the salt marshes and lakes, and is tolerably common; it hunts like the South American Marine Otter, in companies, but only of three or four. It has no claws on the fore-feet, having lost them by natural selection in some way or other, and on the hinder feet the claws are wanting on the outer toes, and only rudiments of them remain on the middle ones. There are, however, pits marking the places where the claws used to exist. The webbing between the toes is also in this Otter rudimentary; the beast, altogether, is very heavily built, with the head very broad and powerful. It appears to be an Otter bent on returning to land habits."

Notwithstanding the investigations of previous naturalists there, the Cape seems to have proved rather a rich field for research to Mr. Moseley, and to have furnished him with some valuable material for "Notes." He was fortunate in finding portions of two skulls of *Mesoplodon Layardi*, a rare ziphioid whale which is occasionally procured at the Cape, and which, strange to say, seems never to be met with or killed at sea, but has only been procured by its running ashore.

The ziphioids, it may be observed, are a group of the toothed whales, and allied to the Sperm Whale. They have the bones of the face and upper jaw drawn out and compressed into a long beak-like snout, which is composed of solid bone, hard and compact like ivory. The upper jaw is devoid of teeth, "having lost them," says Mr. Moseley, "in the process of evolution," and the lower jaw, which is lengthened and pointed to correspond with the upper, retains but a single pair of teeth.

In the species in question, *Mesoplodon Layardi*, these two teeth in the adult animal become lengthened by continuous growth of the fangs into long curved tusks. These arch over the upper jaw, or beak, and, crossing one another above it at their tips, form a ring round it and lock the lower jaw, so that the animal can only open its mouth for a very small distance indeed. The tusks are seen always to be worn away in front by the

grating of the confined upper jaw against them. How the animal manages to feed itself, under these conditions, is a mystery. Prof. Owen, describing the first specimen which was procured of this whale, considered that the tusks had acquired an abnormal direction and state of growth in that particular specimen, and Prof. Flower, although aware of a second specimen, felt doubtful whether such a remarkable condition could be considered normal. Now that more specimens have been procured, however, there seems no longer any reason for doubt on the subject.

It was at the Cape of Good Hope, also, that Mr. Moseley was enabled to collect, examine, and dissect specimens of *Peripatus capensis*, a very curious creature, believed to be a nearly related representative of the ancestor of all air-breathing Arthropoda—*i. e.*, of all insects, spiders, and Myriapods.

“It has the appearance of a black caterpillar, the largest specimens being more than three inches in length, but the majority smaller. A pair of simple horn-like antennæ project from the head, which is provided with a single pair of small simple eyes. Beneath the head is the mouth provided with tumid lips, and within with a double pair of horny jaws. The animal has seventeen pairs of short conical feet, provided each with a pair of hooked claws. The skin is soft and flexible, and not provided with any chitinous rings. The animal breathes air by means of tracheal tubes, like those of insects. These, instead of opening to the exterior by a small number of apertures (*stigmata*) arranged at the sides of the body in a regular manner as in all other animals provided with tracheæ, are much less highly specialised. The openings of the short tracheæ are scattered irregularly over the whole surface of the animal's skin. It appears probable that we have existing in *Peripatus* almost the earliest stage in the evolution of tracheæ, and that these air-tubes were developed in the first tracheate animal out of skin-glands scattered all over the body. In higher tracheate animals the tracheal openings have become restricted to certain definite positions by the action of natural selection. The sexes are distinct in *Peripatus*. The males are much smaller and fewer in numbers than the females: the females are viviparous, and the process of development of the young shows that the horny jaws of the animal are the slightly modified claws of a pair of limbs turned inward over the mouth as development proceeds; in fact, ‘foot-jaws,’ as in other Arthropods.”

Before Mr. Moseley studied *Peripatus* at the Cape, nothing was known of its mode of development, nor of the fact that it breathed air by means of tracheæ. It was generally placed with the Annelids, though its alliance with the Myriapods had been

suspected by Quatrefages. That it is a very ancient form is proved by its wide and very peculiar distribution. Species of the genus occur at the Cape of Good Hope, in Australia, in New Zealand, in Chili, in the Isthmus of Panama and its neighbourhood, and in the West Indies. If its horny jaws were only larger, Mr. Moseley thinks, they would no doubt be found fossil in strata as old as the Old Red Sandstone at least. He makes the following observations on its structure and habits:—

“The animal is provided with large glands, which secrete a clear viscid fluid, which it has the power of ejecting from two papillæ, placed one on either side of the mouth. When the animal is touched or irritated it discharges this fluid, with great force and rapidity, in fine thread-like jets. These jets form a sort of net-work in front of the animal, which looks like a spider’s web with dew upon it, and appears as if by magic, so instantaneously is it emitted. The viscid substance, which is not irritant when placed on the tongue, is excessively tenacious, like bird-lime, and when I put some on a slip of glass, some flies approaching it were at once caught and held fast. It appears from the observations of Captain Hutton on the New Zealand species, that the jet of slime is used by the animal not only as a means of offence, but to catch insects on which the animal feeds. I found only vegetable matter in the stomachs of the Cape species, and concluded that the animals were vegetable feeders. The animals live, at the Cape, in or under dead wood, and I found nearly all my specimens at Wynberg, in Mr. Maynard’s garden, in decayed fallen willow logs, which were in the condition of touchwood. I tore the logs to pieces, and found the animals curled up inside. The animals are very local, and not by any means abundant, so that an offer of half-a-crown for a specimen to boys did not produce a single example. My colleague, the late Von Willemoes Suhm, and I, both searched hard for *Peripatus*. He was unsuccessful; but I was lucky enough to find a fine specimen first under an old cart-wheel at Wynberg. Immediately that I opened this one I saw its tracheæ and the fully-formed young within it. Had my colleague lighted on the specimen he would no doubt have made the discovery instead. *Peripatus capensis* is nocturnal in its habits. Its gait is exactly like that of a caterpillar, the feet moving in pairs, and the body being entirely supported upon them. The animals can move with considerable rapidity. They have a remarkable power of extension of the body, and when walking stretch to nearly twice the length they have when at rest.”

We have been tempted to quote these remarks at length, on account of their originality, and because they furnish a good illustration of the author’s style, and his careful mode of

registering the observations made by him. From beginning to end his narrative is full of interest for naturalists, no matter what their *specialité* may be, and his concluding chapter, which is devoted to a review of the phenomena of animal and vegetable life, at the surface of the ocean and the deep sea, as revealed by the investigations of the scientific staff of the 'Challenger,' may be regarded as furnishing an excellent summary of the present state of our knowledge of pelagic and abyssal animals.

On the whole, we regard Mr. Moseley's book as one of the most important contributions to general and scientific literature which has appeared for some time.

Our Woodland Trees. By FRANCIS GEORGE HEATH, Author of 'The Fern World,' &c. 8vo, pp. 542. With numerous wood engravings and eight coloured plates of leaves. London: Sampson Low, Marston & Co.

As the author of a book on ferns Mr. Heath's name must be familiar to many. Mr. Heath does not profess to be a scientific botanist, but he has a keen appreciation of the charms of English woodland scenery, and appears to be never so happy as when wandering through some forest glade, admiring the endless variations which present themselves to the eye in form and colour, light and shade, or collecting the leaves of the forest-trees to examine their beauty and variety of outline, and their wonderful venation. In thus following his natural taste, it is not surprising that he should have spent much of his time in the New Forest, than which few spots in England are more attractive to lovers of nature, or illustrate more effectively the beauties of woodland scenery. But until we come to Part IV. of his work, entitled "British Woodland Trees," it cannot be said that Mr. Heath has trodden much new ground. Indeed, with such books on our shelves as Evelyn's 'Sylva,' Gilpin's 'Forest Scenery,' Selby's 'Forest Trees,' Wise's 'History of the New Forest,' and some others of less merit, we could almost have dispensed with the first half of the present volume, the greater portion of which is occupied with an account of the author's rambles in and around the New Forest. Although written with a certain amount of artistic feeling, the outcome of an enthusiastic admiration of the beautiful in nature, we miss the philosophy of Evelyn and Gilpin, the

scientific precision of Selby, and the topographical and historical lore of Wise, which lend so much charm to the works of these writers.

Lest, however, we may be thought to do an injustice to Mr. Heath's descriptive powers, we will select an extract which will not only afford a good illustration of the author's style, but will furnish the reader with the route of one of the most beautiful rides or walks to be found within easy reach of the metropolis:—

“The ‘green ride’ commences at the southern end of Epping Forest, and proceeds, in a direction which may be generally described as northerly, to the northern end, within the parish of Epping, winding and turning, during its course, in an easterly and a westerly direction. An opening to it is provided at Forest Gate, by an avenue of chestnuts. Thence it proceeds, taking a westerly course, over the level expanse of Wanstead Flats—covered with grass and heather, brake and stunted shrubs—and continues into the beautiful lime-tree avenues of Bushwood, having on each side, away to the right and to the left, forest glades of oak and beech, birch and poplar, over the green turf being scattered clumps of hawthorn and blackberry, with shrubs of holly and hornbeam. Taking, within the lime-tree avenues, a turn to the left, the ride makes a dip into the forest, passing between two beautiful chestnuts,—trees with enormous limbs rising from noble trunks, and having on each side, as it enters, forest-hollows, with water fringed by blackberry and clustering brake, and margined by oak and poplar, with their trembling leaves glinting in the sunlight. Beyond the wood, where the railway has cut the forest, the ride crosses the railway-bridge, and, in a northerly direction, plunges again into woodland, across turf, through scattered oak and birch, and by forest pools. Thence, on through the long expanse of Gilbert's Glade, margined by oak and hornbeam, beech and birch, with underwood of forest growth. On still through the Manor of Higham Hills, across an undulating ‘drift’ where oak, elm, and beech contrast their varying foliage, passing by the west of Sale Wood, and across the road from Woodford to Chingford Hatch into the ‘Lops,’ a sparsely wood-covered piece of forest, with oak and beech and scattered holly.

“The ride, running northerly, now leads through the undulating surface of Chingford drift, with its fine trees, and passes by the level margin of the Ching—the brook which gave its name to Chingford—continuing on by the large reed pond, under the wide-extending arms of goodly oaks, and through forest glades; rising, as it proceeds, until Elizabeth's Lodge is reached, on the summit of an upland, from which a beautiful woodland view is obtained. Leaving Elizabeth's Lodge, the ride leads across a tract of open forest, to the east of the Great Hawk Wood. Thence on, along

an irregular and tortuous course, through undulating forest to Fairmead Bottom, and away beyond, first to the north and then to the east, through woodland covered by stunted forms of oak, hornbeam, and beech, until the eastern limits of Little and of Great Monkwood are reached—woodlands of rare beauty, with goodly forms of oak and birch, and thickly spreading underwood. And now the ride continues its course along the remainder of the forest glades of Loughton, the home of the Epping deer, where oak and holly, hornbeam, beech, and birch, picturesque but stunted, form the prevailing woods.

“Circuitously now the ride leads on by the upland sides in the woods of Loughton and Theydon Bois, turning first easterly, then northerly, then westerly, and approaching the road to Epping, runs near it by woods of oak and beech, wild apple, birch, and holly. On by Ambresbury Banks, the site of the camp of the warrior Queen of ancient Britain; through Epping town; and on to the Lower or Great Epping Forest, round which it sweeps with a bold curve, ending at Thornwood Common, a course of nearly fourteen miles, including many a scene of sylvan beauty.”

But the most attractive feature of Mr. Heath's book is his treatment of the distinguishing characteristics of trees. Avoiding strictly scientific descriptions, he points out clearly and simply the peculiarities of each species, and illustrates his remarks on the form and venation of the leaves with accurately drawn figures. There are eight coloured plates of the leaves of sixty so-called “forest trees,” several of which, however, can only be so styled by a courtesy akin to poetic license. These plates are carefully copied from photographs which reduced the specimens to half their natural size, and appealing as they do directly to the eye, furnish the reader with the readiest means of identifying the species of any tree with the name of which he may be previously unacquainted. The idea is a good one, and we wonder that it has not before been adopted. We do not doubt that these illustrations, viewed in connection with the author's remarks on the growth, structure, development and uses of trees, will do more to instruct the public than many a more pretentious work on the subject. The book will teach people how to use their eyes, and will enable many to derive a pleasure and a profit from their country walks, which, for want of method in their observations, they have hitherto been unable to realize.

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ANIMAL LIFE AT THE ROYAL ACADEMY.

BY THE EDITOR.

“We have the Exhibition to examine.”

Much Ado About Nothing, iv. 2.

A CRITICISM upon animal-life as depicted in any collection of paintings, to be of value, we opine, should be penned either by an art-critic who is also a naturalist, or (as these qualifications are rarely combined) “in consultation,” as the lawyers have it, by a representative of each of these two different professions. Certain it is that some of the best artists of the day, who from their profession may be supposed to be perfectly familiar with the principles of their art, are unable, from their want of acquaintance with Zoology, to criticise pictures of animal-life from any view of the subject but their own. Equally true is it that a naturalist, however observant he may be in his own particular sphere, must in a great measure fail if he attempt to descant upon an art with the principles of which he is more or less ignorant. The writer, finding himself in the latter category, experiences considerable diffidence in undertaking, single-handed, a critique on animals as depicted at the present time on the walls of the Royal Academy. It is to be understood that he makes no pretension to be considered an art-critic, and the remarks which follow are to be regarded as an expression of opinion by one who views pictures of the class under consideration solely with the eyes of a naturalist.

The configuration and relations of natural objects may be indicated by their circumscribing lines, or by the incidence and distribution of their lights and shadows; or, again, the artist may work upon a system which attends not to their configuration, but to the distribution, qualities and relations of colours upon their surface—the system of colour, as it is called.

Of these three systems, probably, a naturalist, *pur et simple*, is hardly competent to criticise any but the first. His eye, accurately trained by the constant observation of natural objects, is able to detect a faulty outline or the indication of a position or movement which is incompatible either with structure or habit. In such cases he can give reasons for his adverse criticism. With regard to “light and shade” he is more diffident. He may discover a want of reality in the effect produced, but may be unable to say why he considers it unreal. Still less is he able to criticise the method of “colour.” His only standard really is Nature, and in proportion as a picture is natural its value in his eyes is enhanced. Judged by this standard it sometimes happens that a picture which more or less fulfils the requirements of art, fails to commend itself in consequence of some inaccuracy of detail which has escaped the artist’s attention. Thus, where “breakers” are depicted upon a smooth sandy shore, without any opposing bank or rock whereon the waves may break; where spring flowers bloom in an autumn landscape; where sheep in harvest time are yet unshorn; where birds in snow are still in summer plumage, and so forth; such infidelity to Nature causes one to overlook almost entirely any redeeming merits which the picture may possess.

We have not unfrequently been surprised at the errors which are perpetrated, even by Royal Academicians, in depicting some incident of sport or natural history with which the artist apparently is not personally familiar. Thus, we remember to have seen a picture of hawking by a Royal Academician, in which the falconer is depicted as carrying his hawk upon the wrong hand, and without either hood or jesses. Only a week or two since we saw a charming etching on vellum by a modern French artist, in which a falconer was represented as in the act of taking away a Hare from four Kestrels! In the eyes of a naturalist, and in the eyes of a falconer, the artist could scarcely have committed a greater blunder!

When Mr. Hook, R.A., not so very long ago, with that wonderful power which he possesses of depicting coast scenery, took us to the very verge of a precipitous sea-cliff to witness the feat of a daring boy robbing a gull's nest in which four eggs were seen to be lying, he unfortunately selected for his "parent bird" flying to attack the boy a species of gull which happens never to breed in sea-cliffs at all, but makes its nest inland upon the ground. Such errors as these, in the eyes of a naturalist, sadly depreciate the value of a work otherwise so attractive.

Again, how often do we see an illustration of the fact that some of the best landscape painters are but indifferent pourtrayers of animals. A stubble-field in autumn, or a lonely moorside, may be charmingly rendered, so far as the landscape is concerned, but when for effect the artist attempts to introduce a little life, by depicting, say, a flock of Rooks on the one, or a pair of Peewits on the other, the result is rarely successful, the birds being generally so badly drawn as to make it difficult to divine for what species they can be intended. The reason of this shortcoming—that is to say, in the case of birds—seems to be that few artists appear to have studied attentively the anatomy of a bird's wing and the arrangement of the feathers which clothe it. Nor do they seem to have noticed how very different is the shape of the wing in species which belong to different genera. We are aware that Sir Joshua Reynolds, in one of his discourses, has said "Do not study Nature too closely;" but there is a wide difference between studying closely and not studying at all, and in animal painting, at least, the success of a picture must almost of necessity depend upon the accuracy of its outlines. If these are faulty, the most careful attention to light and shade, or to colour, will hardly compensate.

But to come to the present Exhibition. Compared with former years, there seem to be few animal pictures of real merit, if we except the works of Messrs. Ansdell, Cooper, and Davis, who are generally well represented. Of these we may speak in their turn. Mr. Ansdell, among several cattle-pictures, sends only one sporting subject this year (634), Grouse Shooting over a brace of dogs. So often has this favourite subject been painted that it is refreshing to mark in Mr. Ansdell's picture an entirely new and original treatment of it. The dogs, nearly life-size, are in the fore ground, and the sportsman, coming over some rising

ground immediately behind them and full face to the spectator, is represented as shooting straight out of the picture presumably at birds some forty yards in front of him. The fore-shortening of the breech-loader is cleverly effected, and the gillie, who brings up the rear, carries in his left hand a brace of admirably painted Grouse. Apart from the original treatment of the subject, this picture, both in outline and colour, strikes us as the best which Mr. Ansdell has sent this year.

Mr. Cooper has contributed "A Warm Sunny Evening" (257), "Mid-day Repose" (344), "Shadow and Sunshine" (373), "A Group in the Meadows" (717), "The Challenge" (1377), "The Victor's Shout" (1379), and "Receiving the Challenge" (1384); all good specimens of his peculiar mannerism in the treatment of cattle and landscape. Of these we should say the masterpiece is "Shadow and Sunshine," wherein a gathering rain-cloud is admirably represented, and the incidence and the distribution of the lights and shadows upon the cattle most skilfully managed.

A picture with a very similar title, "Cloud and Sunshine" (1399), by Mr. Davis, attracts that attention which is always due to the works of this artist, who as a painter of cattle at the present day may be regarded as *facile princeps*. Much, however, as we admire his landscape, his clouds, and his cows, we could wish that the bird-life which he has introduced had been better rendered. His Rooks are poor and incorrectly drawn. The picture of his which most takes our fancy this year is "A Mid-summer Night" (225), wherein a group of cattle are seen at night upon a pasture. Viewed at a proper distance this picture grows upon the spectator and strikes him as being a most careful study of attitude and repose, while the seeming advances of the dun bull to the white cow are as skilfully indicated as they are true to nature.

Very different to the clean-fleeced—we had almost said carefully-groomed—sheep of Mr. Ansdell are the weather-beaten flocks of Mr. Macwhirter, which give such life to his Highland landscapes. In his "Last Days of Autumn" (81), wherein a shepherd is seen driving a flock of horned sheep down a rocky slope fringed on one side with leafless birch trees, we have an illustration of the striking effect which is produced in a landscape by the introduction of a little animal-life, when that animal-life is skilfully and accurately depicted.

Mr. J. S. Noble, whose name is well known as a painter of dogs, has a good picture (152) entitled "Freedom and Imprisonment," in which a pack of hounds in kennel are represented as suddenly aroused by the passing of the huntsman with another pack *en route* for the cover-side. The eager impatience of the prisoners, as they pace the flags, leap against the bars, sniff at the closed door, or give vent to their feelings by loud baying, is capitally depicted. The colour is good, and the attitudes very life-like. In the case of one hound only does the drawing appear a little faulty—namely, the hound of which a stern view is given, where the hind legs, by being thrown too far under him, indicate a want of power in the quarters. Exception must also be taken to the coats of the hounds, which are too silky and delicate. The coat of a foxhound is more wiry.

It is curious how many blunders are made in hunting-pictures. One would suppose that an artist, if not a hunting-man himself, would have no difficulty in finding amongst his acquaintances some one with a knowledge of the sport and its details, to whom his picture might be submitted for criticism before being sent to Burlington House. But such a course, apparently, is seldom adopted. A very general fault is to depict "a kill" with horses as clean as if they had just come out of the yard; hounds ditto; and the dead fox smooth, sleek, and scatheless! We look in vain for the dilated nostrils, steaming flanks, and mud-bespattered hocks and feet of the hunter; for the open-mouth, blood-stained jaws and lolling tongue of the hound, with a trickle, too, of blood on his lashing stern, betokening close contact with gorse and briar; and for the dragged and blood-stained fur of the "varmint."

A case in point is furnished by No. 413, "The Death: recollection of a kill with the Pytchley Hounds," concerning which we can well imagine some such conversation as the following taking place:—

Spectator. "You see, they have just killed their fox, and—"

Hunting-man. "Not they. They never killed *that* fox, I warrant you. Much too clean. Must have been 'a bagman' which they *meant* to have killed, but which died in the sack on the way to cover! Of course the horses and hounds are nice and clean, because they have been disappointed of a run!"

A more meritorious picture, because truer to nature, is Mr. Hopkins's "Eorrard away" (1393), in which a youthful whip

is seen getting the tail-hounds out of cover, while the huntsman, with the rest of the pack and some of the field, have just settled down on the line of their fox a field away. The attitude of the whip as he turns in his saddle is very good, and his horse—a grey—and the hounds are well drawn; although perhaps a good judge might say that the latter carry a little too much flesh for hunting. But we don't like the chesnut on the left. He appears to be moving two legs *on the same side* at once, which is wrong.

Amongst the sporting pictures, we suppose, must be classed Mr. F. A. Bridgeman's (441), "A Royal Pastime in Nineveh," wherein a king of the period is represented as having descended from his throne in the amphitheatre to slay lions in the arena, while the queen and her attendant courtiers look anxiously on from above. One lion already lies dead, while the king, with bended bow, is in the act of sending an arrow at a second, which has just been turned into the arena. From the position in which the arrow is directed we are not without anxiety for the result, lest perchance the tables should be turned, and the "royal pastime" prove to be for the "king of beasts" instead of for the "king of men." The expression of the advancing lion is very comical; it is impossible to look at him without laughing; he seems to treat the whole business as a good joke. A contemporary has likened the expression to "that of a tom cat going to sneeze." We have often heard the sound he refers to, but have generally been just too late to catch "the expression." It is only fair, however, to the artist to state that his dead lion is really capitally drawn, and that the dresses, arms, and sculpture betoken a careful and successful study of antiquities.

A somewhat remarkable picture is Mr. Herbert Johnson's "Crossing the Sarda: an incident of the Prince of Wales' tour in India" (572). The scene here depicted was thus described in 'The Times' of March 20th, 1876:—

"The afternoon sport was inaugurated by a display rarely given to any one to witness. . . . Such a spectacle was never beheld by living man; and indeed it may be doubted if the like was ever seen in past ages. This was a procession of seven hundred Elephants. The Prince sat in his howdah waiting for three-quarters of an hour, and watching the wonderful column cross the arm of the Sarda. There were six hundred Elephants belonging to Nepal, and about one hundred which had come

over with the Prince. To each Elephant there were at least two persons—the mahout and a man on the pad; many carried three or four people. It is not too much to say that there were 1800 persons engaged in the beat."

The artist has shown much skill and judgment in his treatment of the subject, and by assuming the spectator to be on the river-bank in the fore ground to the right, and causing the procession to pass along the opposite bank from left to right for a considerable distance before crossing, he has obtained, we think, the best possible effect.

From Indian Elephants to Indian Tigers the transition is natural, and we are reminded of Mr. J. T. Nettleship's impersonation of "Fear" (187). Here, by the agency of a flood, two animals of very different natures find themselves, in close proximity, the sole occupants of a floating log. At one corner a huge Python, partially submerged, is just enabled to keep his head above water; while, crouching flat upon the log, with teeth set and ears laid back, lies a Royal Tiger, holding on with every appearance of abject terror. As a study of animal life, good in colour and nearly correct in outline, this picture strikes us as one that commends itself both to the naturalist and the art-critic.

Conspicuous amongst the animal-pictures by its large size is Mr. Bouverie Goddard's "Struggle for Existence" (639)—a remarkable picture.

"By wintry famine rous'd, from all the tract
Of horrid mountains
Cruel as death, and hungry as the grave!
Burning for blood! bony, and gaunt, and grim!
Assembling Wolves in raging troops descend,
And, pouring o'er the country, bear along,
Keen as the north wind sweeps the glossy snow.
All is their prize."

THOMSON'S "WINTER."

This is the scene which the artist has depicted. A pack of wolves, nearly life-size, driven to desperation by the severity of the winter and their inability to procure food, are engaged in fierce conflict in their "struggle for existence." The weaker are being gradually overcome, and are being killed and eaten by the stronger, a scene which aptly paves the way for a second

picture which possibly we may see next year upon the walls of the Academy, under the title "The survival of the fittest." We like this picture much, although its size strikes as being inconveniently large. But there is evidence of careful observation of the animals delineated. Each separate wolf is a study; the attitudes are varied and well chosen, and the fore-shortening in some cases is excellent; while an admirable effect of colour is produced by the juxtaposition of the thick grey fur of the wolves and the glistening white of the snow in which they are fighting. A little more blood upon the snow, although not a pleasant thing to look upon as a rule, would have added, we think, greater force to the picture. If we have one fault to find, it is from the naturalist's point of view. It has been observed of wolves that they always make a combined attack upon their victim, and one would therefore expect to see the dead wolf in the fore ground in the process of being torn to pieces and devoured, instead of being allowed to lie unmolested as soon as he has ceased to struggle. Upon this point, however, the artist has perhaps exercised a wise discretion. After all the great aim of art, in the first place, is to please, and it cannot be said that the contemplation of blood and mangled remains can be productive of pleasure to anyone. The dead wolf, therefore, must either be *supposed* to have been eaten, in which case he would not be seen, or he must lie there in his entirety. The artist has preferred the latter alternative, and in no other way, does it seem, can "the survival of the fittest," in this case, by the death of the weakest, be indicated. For one wolf may be as good as another, and it does not necessarily follow that a struggle of the kind depicted should always end in death. Thus, we take it, in this case the naturalist must give way, and allow that the artist is right.

An equally remarkable picture, though for a different reason, is "The Poacher's Widow" (195) by Briton Rivière. We presume it is intended to be pathetic, but it nearly approaches the ludicrous. The widow in question, without bonnet or shawl, although it is night, is seated on the ground behind a solitary furze-bush on the slope of the hill at the edge of a cover. With her hair dishevelled and her head buried in her hands, she is absorbed apparently in contemplation of the spot where her husband, the poacher, met his death. But the solemnity of the

idea suggested by the lines of Charles Kingsley, and which the artist quotes—

“She thought of the dark plantation
And the hares, and her husband’s blood,”

is banished at once by the appearance upon the scene of thirty odd rabbits, four cock pheasants, two hen ditto, and two hares, all of which are represented as feeding and playing within a very few feet of the unfortunate widow. Apart from the absurdity of introducing this quantity of game, or any game at all for the matter of that, *in such close proximity* to an intruder, the details of the picture suggest several points of criticism, none of which can be considered favourable to the artist. In the first place pheasants have no business there at all, for the scene is “moon-light,” a time at which, as every sportsman knows or should know, all good pheasants are at roost. In the next place, assuming that pheasants are legitimately introduced, one would hardly expect to see the old-fashioned *Phasianus colchicus* amongst them, this species having become well-nigh extinguished by constant interbreeding with the Chinese *torquatus* and Japanese *versicolor*. Except in districts far removed from the great centres of game preserving, one rarely meets with a bird of the pure old breed. Again, the relative proportions of hare and pheasant are not well preserved, the former being depicted as not much larger than the latter, and of such insignificant weight as to make little or no impression on the laid corn on which they are sitting. Possibly the picture is intended to point a moral as well as to adorn a tale! And we are perhaps to infer that the poacher could not have been so black as he was painted, or he would not have left so much game behind him! At all events, from a naturalist’s point of view, we should be grateful to him for having spared the above-mentioned *Phasianus colchicus*.

Amongst the marine paintings in the Exhibition this year there are several which we should like to notice, did space permit, but we are only able to refer to two or three. “The Sea-birds’ Resting-place” (447), and “Where deep Seas moan” (1386), both by Mr. Peter Graham, especially attract the eye of the naturalist by the bird-life which is skilfully introduced, and the artist’s clever treatment of precipitous sea-cliffs and heaving waves. By the way Mr. Graham, in the latter picture, has given

his Herring Gulls *yellow* legs and feet, which, if the cliffs are Scotch, as we take them to be, would not be quite correct, the yellow legs being indicative of the Mediterranean Herring Gull, the same parts in our bird being flesh-coloured.

In Mr. Hook's otherwise admirable painting of the "Mushroom Gatherers" (275), we have seldom seen anything so badly drawn as the uppermost sea-gull, which is supposed to be flying, in the top left-hand corner; it is—we regret to say it—a positive deformity. Few artists, strange to say, seem to know anything about the anatomy of a bird's wing, and in nine cases out of ten, in a bird with extended wings, the drawing is all wrong. On what part of the coast mushrooms may be found growing on the rocks, as indicated in this picture, the Catalogue does not inform us. We have certainly never seen them so near high-water mark before, and the specimens collected present a *fungoid* appearance which reminds us a great deal more of Cooke, M.C., than of Hook, R.A. However, there they are, by Hook or by Cooke.

There are numerous other paintings by minor artists which profess to deal with Natural-History subjects, but which embody some unfortunate blunder which generally spoils the picture. Thus we have a Peewit represented as leaving a nest of eggs which do not belong to her; a Heron standing in a pool *at the foot of a fall*, where one would naturally expect to find the water of such a depth as to make it utterly impossible for the bird to stand there; and so forth. Of such pictures as these we need only say that the authors should study Nature a little more closely.

One more picture only remains to be noticed ere we bring these remarks to a close—namely, Mr. Marks's diploma work (379), deposited on his election as an Academician, and entitled "Science is Measurement." Those who remember "The Ornithologist," by the same hand, which was exhibited a few years since, will recognise in the present picture the peculiar mannerism which distinguishes the works of this artist—a mannerism which always indicatés a keen sense of humour. An anatomist of the old school (so we judge by his costume) is represented as engaged in carefully measuring the skeleton of a huge bird, an Adjutant. His pencil is in his mouth, a book under his arm, and a tape-measure in his hand, while in an open

portfolio before him lie numerous notes and sketches, to which he has evidently been referring in the course of his studies. Before him is set up the grim skeleton of the Adjutant, and the contrast between the figure of the old man and the anatomical outline of the bird is irresistibly ludicrous, while at the same time pleasing; for there is a refinement in Mr. Marks's humour which always makes his pictures attractive.

On reperusing the foregoing pages it occurs to us that we might have noticed the pictures that we have referred to in the order of their numbers in the Catalogue. We might have commenced in Gallery No. 1, and, book in hand, have gone steadily through to the Sculpture Room. But we have preferred to travel a little out of the beaten track—to look for pictures of animal-life without reference to the Catalogue (to which we have only turned to discover the artist's name); and to criticise those pictures, as we have said, not with the eyes of an art-critic, which we do not pretend to possess, but with the eyes of a naturalist. With Edmund, in 'King Lear,' we say:—"Thou, Nature, art my goddess; to thy law my services are bound."

A VISIT TO A BREEDING-PLACE OF THE PELICAN IN THE DANUBE-DELTA OF THE DOBRUDSCHA.

(From the German of PAUL and MAX SINTENIS, of Bolkenhain, Silesia.)

BY CARL ARMBRUSTER.

DURING our stay in the Dobrudscha we had commissions from various quarters for eggs of *Pelecanus onocrotalus* (which was supposed to breed there), for authenticated specimens were rarely or never in the market. We undertook these commissions with all the more pleasure because it would give us an opportunity of investigating the Danube-Delta, which, zoologically and botanically speaking, is quite unknown, and because this immense reed-wilderness justified the expectation that a breeding-place of the gigantic bird would be found there.

On June 15, 1874, we started from Cukarova, near Bahadagh, our residence at that time, fitted out with all necessaries, and two days later, after a highly interesting and profitable journey in a waggon, we arrived at Kederless, a large fishing village, situated

at the extremity of the St. George estuary, in the south-eastern corner of the Delta. All the information which we collected here pointed to the north-west, and on June 19th we had already found a new home in the Russian colony Kara-Orman (black forest) in the Delta-forest of the same name. Here we made the necessary enquiries after breeding-places, and personally visited almost all the spots named, without, however, attaining our object. Unfortunately fish were scarce this year, and we found all the supposed breeding-places deserted, and all our trouble seemed in vain. By this time the month of July had begun. Good fortune at length brought us in communication with two Russian fishermen, Fetka and Demian, who were reputed good shots, and who gave us their word of honour that they had discovered a large breeding colony of the bird we were in search of. Like all their predecessors, they demanded a Turkish lira (about nineteen shillings) per day each, besides their food. We resolved to make a last attempt, and accordingly sent them with our faithful and long-tried *chasseur*, Ferdinand Beyer, into the Balta, on July 6th, to bring us some proof of the truth of their assertion. What followed we take from our diary, believing that the impressions which we noted down on the spot will convey the best idea of the situation. We must ask the reader's kind indulgence, however, for these notes were never intended for publication, and were made under circumstances which precluded attention to form and style.

July 8, 1874. At last we have attained the object of our wishes—a well-stocked breeding-place of *Pelecanus onocrotalus* is found! We reached the spot after considerable trouble; it is a little "liman" (lake), surrounded by a circle of half-floating islands. Upon the latter are the nests, each one containing from two to four eggs. Many eggs are still unhatched; in many the young are screaming. Naked birds, others in the down, half-fledged ones and full-grown birds, all mixed up. Ferdinand has shot four old Pelicans; the two Russians five, amongst which is a single *Pelecanus crispus*. Besides these the following have been procured:—*Cygnus olor* (two adult and seven nestlings), *Ardea purpurea* (one), *Podiceps cristatus* (one), *P. subcristatus* (four),* *Anas nyroca* (three), *Larus ridibundus* (three), and *Sterna hybrida* (one). Of the last-named Sea Swallow a

* *Podiceps subcristatus*, Jacq. = *P. rubicollis*, Latham.—ED.

breeding-place, with fresh eggs, has been likewise found; we shall fetch them as soon as possible. Ferdinand has also brought with him more than two hundred Pelican's eggs. *Sterna hirundo* also breeds there, as well as *Larus ridibundus*. The nests of the latter rest upon the leaves of water-lilies; the young are already well-fledged. The larger specimens having been left behind at the "skelle" (a landing-place for boats), situated to the west, we take a carriage and drive there, and an hour later reach the place. The young Swans in down, of the size of a Goose, are particularly pretty; but unfortunately we shall be able to skin but very few, for the heat is intense, and the birds begin to smell; we shall do our best, however, and shall at all events preserve the skeletons. Thus we are again engrossed with work. It is most important that we should proceed to the neighbourhood of the colony, in order to work there, because, at this distance, it is almost impossible to obtain fresh birds. Of course our sojourn there will be attended with many difficulties—swarms of mosquitos (*Culex pipiens*), contaminated air, undrinkable water! About half-way in the Balta there is a fishing-hut, where possibly we may be able to stay. To-morrow the two Russians will drive to Lake Obreteno for a couple of days to shoot wild geese and divers. On their return we think of starting. We shall then be able to report more exactly from personal observation. At sunset we reached the village with our booty; we paid the men liberally, and then set to work at once. We worked until far into the night. First, a number of eggs were blown; they seemed to us larger than *P. crispus*. A Swan's egg has also been found; the contents, however, were rotten, as we had expected. Two *Anas nyroca* and two *Larus ridibundus* were skinned. The colony is said not to be half so large as it was last year. The old birds behaved very shyly, and, after repeated shooting, flew away altogether, so that unfortunately many of the abandoned young ones died of starvation. Altogether the birds seem to be badly off for food. A great many Sea Eagles and Marsh Harriers made their appearance at the colony this morning. Bearded Tits are everywhere frequently seen, as well as Moorhens and a single Bittern (*Ardea stellaris*), but only four *Ardea garzetta*. On one island were found some last year's nests of the Little Cormorant (*Carbo pygmæus*), "Malenka Paklan," as the Russians call it, some old willow shrubs, it is said, being quite studded with them.

Possibly we may find a colony of these birds. An old Cormorant (*C. cormoranus*) and a half-fledged young one in an interesting state of plumage were also procured.

July 9. We were at work at daybreak; heat intense, swarms of flies. Unfortunately only one of the Swans in down could be prepared; of the others we only took off the skin of the breast, as we did also off the old one, which had no quill-feathers left. The Cormorant made a good specimen. We hardly spared time for eating. It is remarkable that young Pelicans on leaving the egg are quite naked; we shall put some of them into spirit. Every evening now the Balta cockchaffers (*Melolontha fullo*) appear in immense numbers and fill the air with their humming.

July 10. Fine weather, but hot. Skinned and prepared the Pelicans. Nasty work; everything smells badly, and will not keep the feathers. We are very badly off for material for stuffing; we had taken with us a large bag of sea-weed (*Zostera nana*) from Tschukarova, but this was used up long ago. There is no soft hay to be had here, nor any straw; thus we had to look out for reed-tops. After many fruitless searches, we at length found some in the roof of a newly-built house, which were at once taken into requisition. We shall not be able to visit the breeding-places to-morrow; nobody will take us there, for everyone is occupied with the harvest; nor have we yet found time to prepare the skeletons we wished. Two boys brought us three young *Falco rufipes* in down; they were of medium size. The two we got on the 6th are getting on very well and afford us much amusement; their food consists of meat only. A thunder-storm in the evening.

July 11. Fine weather. Finished our work; the three little Falcons got yesterday are also prepared. We have not made any skeletons, however, the specimens being too much damaged by the shot. To-day again we looked in vain for guides for to-morrow, and have now resolved to row alone in a larger boat as far as the fishing-hut, and to try and find somebody there who will take us on; perhaps the fishermen will consent afterwards to come with us. In the afternoon we had many visitors, Turks and Russians, who were anxious to see our collections.

July 12. In the forenoon we visited Fetka and Demian, and asked them for their large boat to row to the fishing-

hut, which request was readily granted. But they warned us not to go alone into the Balta, a warning which we did not heed. At noon we started with Ferdinand, our *chasseur*. As we expected to get some Bearded Tits, we took all necessary implements with us, including egg-drills. But as we only intended to be absent until evening, we neither took any provisions nor the very necessary mosquito-net. Heat beyond description. The journey to the landing-place across the glowing sand was anything but pleasant. But we were soon in the large boat, and cheerfully rowing across the narrow channel. At first we were hemmed in on both sides by the lesser bulrush (*Typha angustifolia*) almost exclusively, amongst which *Ranunculus lingua* blossomed beautifully. Here and there we could certainly hear a Bearded Tit, but could not see one. We had a pleasant surprise in the occurrence of a doubtful little plant, which floated everywhere on the water's surface, sending up little round whitish green blossoms. This was *Aldrovanda vesiculosa*. For about an hour we proceeded very smoothly, but at length floating islands barred the water-way, which was hitherto free. We had to push these islands aside with much trouble, and with our united strength we at last succeeded in breaking through, and arrived upon one of those little lakes covered with water-lilies (amongst them *Nuphar*), of which there seem to be numbers in the Delta. *Anas nyroca* swam about in little flocks. From here we had again to work through floating islands, which so barricaded our way that we at last doubted whether we should ever get any farther. It cost us much time and trouble. All at once, on pushing through the reeds, we looked across the surface of a larger lake. We had reached the "Liman Kuibide." A greater number of these floating islands is dispersed over this lake, which is adorned by *Nymphæa* and *Nuphar*, and in places is thickly covered with water-milfoil, *Myriophyllum spicatum* and *verticillatum*, with glistening green panicles. A few Cormorants, many Ducks (all *Anas nyroca*) and Sea Swallows (*Sterna hirundo*), enlivened the scene. We rowed right across the lake to the reedy shore opposite. Quite a remarkable phenomenon to us were the floating nests of *Sterna hirundo*! In a shallow cavity two eggs were always lying in the middle of a real little island of reed-roots and portions of other aquatic plants which had drifted together. These islands are barely a square foot in size, and never carry

more than a single nest; they seem entirely to float on the water, which is from twelve to twenty feet in depth. These nests were generally at some distance from one another, and generally in places covered with the water milfoil (*Myriophyllum*). The large numbers of Terns flying about seemed, however, to be out of all proportion to the few nests we saw. The breeding birds were rather shy. *Sterna nigra* and *hybrida* were also seen several times. At the opposite bank we looked in vain for the entrance to the "Girila" which leads to the fishing-hut. Several times we penetrated the labyrinth of floating islands, but were always compelled to turn back. In this way the time passed, and we were obliged to give up our plans. It wanted but two hours of dusk, and we could not possibly delay longer our return journey. We thought we knew exactly the direction we had to take, and had no idea of the extraordinary difficulty of finding one's way in this treacherous wilderness. We rowed back across the lake towards the opening we had come out of—but where was it? It could not have been anywhere else but here, and with all our might we forced our boat into the thicket of reeds. With infinite trouble we made our way for about a hundred yards, until it was impossible to get any farther. Now back again to the lake! but where is the path we have just forced our boat along? The yielding reeds have closed over and concealed it. Only he who has convinced himself with his own eyes can form any idea of this enormous wilderness. The whole Balta—who knows its extent?—consists of nothing else but floating islands; not a single firm spot is to be found, not even one of a square foot in size. All turns, moves, unites and separates. The islands vary considerably in size; all bear the wildest vegetation—reeds (*Phragmites*) from twelve to twenty feet high, and ferns (*Aspidium thelypteris*) from four to six feet in height. The latter represents the underwood, as it were. Water-hemlock (*Cicuta virosa*) and *Rumex* of different species are there most conspicuous. *Stachys palustris*, *Scutellaria galericulata*, and *Polygonum persicaria* and *hydropiper*, and sometimes *Epipactis palustris*, grow now singly, now in batches, on the margins. Each separate island is a charming group of plants, than which no gardener could compose a more beautiful one—the whole is of exquisite beauty. Magical sunlight flows through the great solitude. Not a breath of air is stirring, but mysteriously the reeds rustle on and on; only the

song of the Great Reed Warbler (*Acrocephalus turdoides*) interrupts the loud silence for some minutes. These floating reed forests are intersected by innumerable broad and narrow channels, which, with a depth of from fifteen to twenty feet, form a treacherous cover of aquatic plants, and are here and there quite choked by them, particularly with hornwort (*Ceratophyllum*) and water soldier (*Stratiotes aloides*). The latter reaches a foot high above the surface with its sharp leaves, and adds to the difficulty of navigation. Charming as this labyrinth of islands may be, it becomes appalling to him who loses his way in it! We soon found ourselves in this predicament, and although we continued to try our luck in different places, it was always in vain. Our strength began to fail—hunger made itself felt. We could not resist a feeling of oppression. The sun sank, and with it our last hope; for without it there could be no question of our inability to find our way through the dense reeds. We were at some hundred yards distance from the lake, and thoroughly wedged in between the floating masses. It was impossible to get a footing outside the boat; as soon as we tried to step on supposed firm ground it sank immediately, and the water threatened to engulf us. And then we had to look forward to the most terrible torments from that army of flies, the blood-thirsty mosquitos; We could not possibly pass the night among the reeds; we were bound to try all we could to regain the lake at least, and with it freer air. We forced our way back with the power of despair, and breathed more freely when at last we regained the smooth surface of the lake. Rowing along the reed-banks, we noticed a spot where formerly a fishing-hut seemed to have stood. This we selected for our camp. Of course it was but a shaky cover composed of dried reeds, yet it seemed firm enough to carry us and the boat. With our hunting-knives we quickly cut off green reeds and ferns, arranged them for us to lie upon, and turned our boat upside-down upon the whole, hoping thus to be a little protected from the mosquitos. But our scheme was not successful: the ground gave way considerably, and the water rose higher and higher. We turned our boat over again, lined it with reeds and covered it completely with them; here at least we could not get drowned. Now we crept in between the reeds through a little gap, and pressed closely against one another, hoping thus to be able to sleep for a few hours. But this, too,

was impossible: we were lying as if buried alive—impossible to bear it. Again we crept out of the narrow space, and to our horror we heard the “hum” of the mosquitos on all sides. Night had set in; the stars shone feebly; and we had no alternative but again to float our boat, to sit down in it, and to row out upon the open lake, where we supposed there would be more draught, which we knew did not suit the mosquitos. And this plan turned out the best. In the middle of the lake we took in the oars, covered our heads with our handkerchiefs as well as we could, and gave ourselves up to the waves, and tried to sleep.

July 13. The biting cold and tormenting hunger, as well as anxiety for our immediate future, did not allow us much rest. The night, instead of refreshing us, caused us to be all the more worn out. The conviction gained ground more and more in our minds that it was perfectly impossible to penetrate the island-labyrinth. The last hope, that in the course of the day a human being might pass the lake, was so very doubtful that we could hardly give it a thought; because, in the first place, everybody was occupied with the harvest, and in the next, the Kara-Orman Russians came this way but rarely and quite accidentally; while from the other side probably not a soul came all the year round. We waited for daybreak with broken spirits. At the first dawn the lake birds became lively. *Sterna hirundo* and *nigra* hunted about, screaming; Ducks came and went, so did Cormorants and little white Herons. But our condition hardly disposed us to contemplate the interesting doings of these happy birds. When the red glow of sunrise was reflected by the waters, we left our station and rowed doubtfully along the reed-border, gathering fresh hope that we might find the right track after all. It was perhaps the twentieth time that, at a seemingly favourable spot, we made the attempt to force our way through, with the firm intention not to turn back, however great the obstacles we might meet with. We had two guiding points—the sun and the summit of a tree, no doubt belonging to the forest of Kara-Orman; the latter, of course, we could only see on the lake when standing on the seat of our boat. Our spirits revived a little when the sun rose, the warm rays acting beneficially; the dew was sparkling upon the leaves. In a situation a little more favourable than ours the magnificent surroundings would have rendered us the happiest of mortals,

because the effect which the ever-changing islands make defies all description. Of what avail was our attempting to signal? At the next moment the reed-bush we had just bent over stood in the exactly opposite direction, and the passage we had only just forced with infinite trouble had disappeared without leaving a trace. What little strength we had left hardly sufficed to get us back to the open lake; and here we rowed to and fro without an object. Noon could not be far off; the heat was scorching. In due time we looked forward to another night in the boat, and had a great mind to shoot Sea Swallows and devour them raw; when all at once—we hardly believed our eyes—at the edge of a distant reed-bed a boat appeared, similar in shape to a Pelican, guided by two men in their shirt-sleeves, as a look through our telescope showed us. We quickly fired off our guns and shouted with all our might. They soon saw and came towards us. They were fishermen from Kara-Orman whom we knew. They listened to our tale of sufferings with a significant smile, and merely said that many had lost their way on the “Kuibide”—that they themselves had frequently missed it, although they were often this way. They appeared to us, however, like ministering angels, and we indeed thanked heaven, for no other boat probably would cross the lake this week, the peasants being all in the fields and absent from the village till Saturday. For some reason or other these two went to the fishing-hut on the “Girła,” where we proposed to go, and since we expected to find food and drink there sooner than elsewhere, and did not care to return home without some object, we rowed along with them. Now we entered the reeds in quite a different place, and after rowing a few yards we reached a narrow canal, which some ten minutes later ended in the “Girła Litkow.” Upon this we now proceeded. The Girła is very deep and broad, and goes a great distance through the Delta. Half-an-hour later we reached the fishing-hut, a little hut situated romantically below high willow trees, with a little kitchen-garden, which we certainly never expected to find here. A friendly old fisherman greeted us and asked us to come in. He was soon acquainted with our adventure, and took pains to get us some food as quickly as possible. This consisted of fish and “mamelika.” It is needless to say we never sat down to dinner with keener appetite. After the important business was over, and we felt restored to life, we enquired whether it was possible

to live here for a few days. The old man, however, was not the master, but the servant, and could not give us a decisive answer, but he did not doubt that it could be managed, and that some small boats might be lent to us. We should have liked very much to wait for the return of the proprietor, who was absent, but the two Russians wished to return home, and thus we had no choice. In the Gírla float large masses of *Lemna polyrhiza*, gigantic specimens; we gathered a quantity, and then proceeded on our return. This, of course, took us less time than the outward journey, yet in several places we had quite work enough to get through. Late in the afternoon we again reached the "skelle" (landing-place) from which we had started, and without stoppage we returned to the village, where we were already believed to be lost. We heard afterwards that the two Russians had come out expressly to look for us. At the village inn we celebrated with them our happy return in a glass "fresh from the cask."

July 14. Before we started on the 12th some boys brought us several young *Falco rufipes* in down; to-day we skinned three of these. The heat is overpowering. The same boys came to-day with four Rollers (*Coracias garrulus*), of which one was also skinned. Besides these we obtained a very fine Eagle, *Aquila naevia*, in nestling plumage. We shall therefore have plenty of work for to-morrow, and the day after we shall start for the fishing-hut, but it will be very difficult to get guides.

July 15. Fetka and Demian have flatly refused to accompany us to the Pelican colony—they must go to the fields, the corn is over-ripe. Thus, there is nothing left but to trust to our own strength, and again to make the journey with our *chasseur*, however rash it may be to do so. In the morning we finished preparing two of the Falcons and the young Eagle; in the afternoon we boiled some arsenical soap. The heat continues to increase. Towards evening we looked out for a conveyance to the "skelle" for to-morrow, as we shall have to take plenty of luggage, but we could not find one; there is hardly anyone at home—they are all in the fields.

July 16. This morning, again, we looked in vain for a conveyance. There is nothing for it but to walk over to the "skelle." The luggage, therefore, was reduced as much as possible, notwithstanding which a goodly quantity was got together. We

started about noon, and consequently got into the greatest heat, from which we suffered considerably. We lost our way into the bargain. The two little Red-footed Falcons we carried with us, too. At the "skelle" we took the first boat we could get and pushed off. On the road we met an old fisherman, who advised us to return, for the wind had caused great confusion amongst the islands; but we were not to be deterred. The graceful *Aldrovandra* now blossoms in quantities. The passage through the floating islands again caused us considerable trouble to-day, but we reached the "Kuibide" without accident, and on the other side soon found the right entrance to the "Girila." We reached the fishing-hut by the most beautiful evening light. The "master" received us very kindly, and at once assigned us quarters—*i. e.*, he gave us permission to open our mosquito-net by the side of his hut, and to do our work under it. After partaking of a good dish of fish, we made the necessary arrangements for to-morrow, for we were anxious not to lose time, and wanted to start for the Pelican colony as quickly as possible. Two little boats were soon found, and the old man's boy was to accompany us. Soon after sunset we had to retire under the net, the mosquitos swarming in millions.

July 17. Immediately after breakfast, which we had soon after sunrise, we began our journey. We had to row along the Girila for two or three hours, and then to turn to the right into the reeds. We therefore resolved to row as far as possible in our comfortable, larger boat, and took one of the smaller boats in tow, the boy getting into the other one. A deep blue sky smiled upon our enterprise. Our progress became difficult only too soon, for the broad channel was almost entirely overgrown with plants,—*Stratiotes*, *Ceratophyllum demersum* and *submersum*, and *Nymphæa*,—so that large patches looked more like meadows. It cost us a deal of hard work to get through. At every stroke of the oars innumerable small butterflies flew up. The rays of the sun became scorching, and only rarely a breath of air refreshed us. We may have rowed for some three hours, when at last we noticed the place in the reeds where we had to enter the thicket. Here we anchored our large boat and got into the smaller one, which at first we had to drag over some fifty yards of shallow ground. The thicket was at first exclusively formed by bulrushes, adorned with *Ranunculus lingua*, *Stachys palustris*, *Polygonum minus*,

and *Nasturtium*. We soon entered the higher reed-beds, and progressed very well, the reeds being not quite so dense here, and the surface of the water being covered with the frog-bit (*Hydrocharis morsus-ranæ*). Besides this pretty plant, we noticed the magnificent *Villarsia nymphæoides*, the odorous golden-yellow flowers of which are the most beautiful ornament of the Balta. Here we also remarked *Ceratophyllum platyacanthum* with fruit. Snails, spiders, small butterflies, and beetles inhabit this lonely wilderness. We passed several floating islands, but were not obstructed by them. On one of these our *chasseur* informed us that we were now only some thirty yards away from the nearest eggs. At this announcement we were not a little excited, but rowed along silently. The reeds got thinner; a little "liman" (lake) appeared, bordered by floating islands. Upon these we saw a few eggs, either of *Pelecanus onocrotalus* or *crispus*—we could not decide which, because no bird was to be seen. We had certainly come upon a deserted nesting-place, such as Ferdinand had already described to us. We therefore did not lose much time here, but tried to find the right breeding-place. This could not be found so easily. We had to pass a great many floating islands, as well as a few open patches of water. Upon the latter we saw numbers of Cormorants. We also found a young Pelican (*P. crispus*), which could not yet fly, and after chasing it for some time we caught it alive. Upon these islands we noticed gigantic specimens of the water-pepper (*Polygonum hydropiper*) in blossom, as also a very plentiful *Nasturtium*. *Solanum dulcamara* and *Convolvulus sepium* climb up to a great height and are covered with blossoms. Here and there the surface of the water is densely covered by the golden-yellow flowers of the common bladderwort (*Utricularia*). At length we reached the right "liman." This deserted place, as we subsequently learnt, bears no name. Through the reeds of the last floating islands we could overlook the surface of the little lake, in the middle of which was a large patch overgrown with *Nymphæa* and three little reedy islands; its borders being also formed by half-floating islands. Opposite to us we saw a large flock of Pelicans, partly swimming, partly standing up among or before the reeds. The sight was a charming one. A most peculiar music, if we may so call it, reached our ears, sounding as if several jew's-harps were being played at the same time. Numbers of Pelicans, too, were

flying about. After having looked at this highly interesting scene for some time we resolved to make a raid upon these fine birds, in order to ascertain, amongst other things, with which species we had to deal. A few powerful strokes of the oars sent us out upon the lake. Here the number of eggs lying about upon the islands was surprising. On looking through the reeds we saw quantities everywhere. Before commencing a detailed examination of this breeding-place, we rowed directly to the opposite reed-border to secure some good specimens, as mentioned above, but were surprised at not seeing any breeding birds—all the eggs were deserted. On approaching the patch of water-lilies above referred to, our attention was attracted by a flock of little Sea Swallows, which flew screaming over our heads, and appeared much frightened. Now and then a pair of these little birds came down into the dense cover. The leaves of *Nymphaea* here reach about a foot above the surface of the water, and form one confused mass with the floating plants. For the moment we deferred a close investigation, but at once recognised *Sterna hybrida*, and supposed this to be one of their breeding-places; Ferdinand confirmed this. We cautiously approached the flock of Pelicans; but, much to our disappointment, the shy birds rose before we were within shooting range; they were almost exclusively *Pelecanus onocrotalus*, old birds, which took flight at once. Only a small number, forty or fifty, alighted on the water again at some hundred yards distance. These were young birds which could not yet fly properly, and to our great surprise were all *P. crispus*. Only two greyish-brown birds, in downy plumage, had remained behind, and tried to escape by paddling along violently. We quickly gave chase, rowing after them and trying to seize them with our hands—by no means an easy task. Only when we directed both boats on one of the birds did we succeed in catching it. With the other one we went to work in the same way, but it escaped into the dense reeds, and thus we lost it, as we could not possibly follow it. The fledged flock of *P. crispus* swam about in a closely-packed column upon the lake, and we did not pursue them, although it would have been an easy matter to have annihilated the whole lot in a short time. We must not omit to describe the peculiar behaviour of the *Pelecanus crispus* which we caught alive at starting. In vain the bird made efforts to use its wings and fly away on becoming

aware of our hostile intentions. Now it cruised about cleverly on the little "liman," and several times escaped by turning sideways when we were within a yard or so of it; but the continued paddling tired it at last, and it seemed to yield to its fate. Then suddenly it seemed to wish to hide in the water, because it dived down deeply with its beak, inflating its gular pouch widely. This process it repeated three times, which interested us so much that for some minutes we gave up the pursuit. But at the third dive it opened its beak widely, and to our surprise forced out a mass of small fish; and soon afterwards a second and a third lot, evidently trying to lighten itself, and again made attempts to fly, but was again unsuccessful. A few minutes later we drew the poor thing into our boat. Here it behaved very boisterously, snapped at us and struck out with its wings. This caused our "nutshell" to sway to and fro in a threatening manner, so that we had to bind the creature to keep it quiet. We next turned to the water-lilies, in the hope of finding nests of *Sterna hybrida*, in which hope we were not disappointed. But most of the nests were empty; in some four or five only were there eggs—three in each—nearly incubated. The nests stood upon the large floating leaves, generally hidden by other leaves, forming a screen above them. The whole breeding-place is only a labyrinth of leaves and stems of *Nymphæa*. After searching for awhile we found several young birds in down. These graceful little creatures were already complete adepts on the liquid element, and with wonderful agility swam about, chirping. Five of them we took with us alive, and we also shot some old birds, so as to be quite certain there was no error in our identification of the species. Then we began taking the Pelican's eggs. We were surprised, as we have said, at the number of young specimens of *Pelecanus crispus*. Only two young *P. onocrotalus*, in downy plumage, were found. Now of what species are the eggs? Do *P. crispus* and *P. onocrotalus* breed in company here? This is hardly to be supposed, because, according to former observations, the two species are said to keep strictly apart. On the 7th inst. our *chasseur* found the colony well stocked with *P. onocrotalus*, both breeding-birds and young ones in all stages of development (there were also some young of *P. crispus*, but they were already fledged). Now where have the young ones got to? We examined most of the islands with the keenest attention, and

with the following results :—Of course the number of eggs upon each island depends upon its size. The largest islands might have been occupied by twenty or thirty breeding-birds, but quite small ones, sufficing only for one bird each, were quite as numerous. Now these islands are more or less composed of reed-fragments, often without any fresh vegetation, often also bordered by green rushes and other high plants. The aspect of the large white eggs shining through the green all round is very charming when seen from the middle of the lake. But when closely inspected the places look very dirty and slovenly. The smell was bearable, the process of fermentation and putrefaction being generally over—a sign that the birds had not laid since the 7th instant. Generally there were two eggs in a nest, but there were also plenty of single ones. Nearly half as many eggs as were lying on the islands were floating on the surrounding water. The latter keeps sending up air-bubbles, by which it is kept in constant commotion, no doubt produced by the substances putrifying at the bottom. The eggs were in all stages of hatching, but in most of them the young birds were very fully developed, so that we had some trouble to find a number which could yet be blown. The eggs which our *chasseur* had taken on the 7th were, on the average, far less advanced, and it does not seem to us at all improbable that the heat of the sun may have had some influence upon the abandoned eggs; at least to a certain extent. Our doubts as to the species of Pelican were gradually set at rest. Almost on every island, perhaps with the exception of five or six only, there were lying beside the eggs putrefying and putrefied young specimens of *Pelecanus onocrotalus* in down—not a single *P. crispus*. This, in connection with the fact that on the 7th inst. our *chasseur* had shot the four *P. onocrotalus* upon their nests, makes us certain of the genuineness of the eggs. The young of *P. crispus*, which are now moving about here, may very possibly have come over on their own account from another neighbouring colony. The cause of the desertion of this breeding-place must doubtless be looked for in the want of sufficient nourishment for these voracious birds; fish are anything but plentiful this year. The arrival of Ferdinand with the two Russians may also have had some effect, because their visit doubtless did not pass off without the expenditure of a good deal of powder. The shyness of the older birds

confirms this. Larger flocks were constantly circling over the lake but did not dare to come down. We shot one, which proved to be an old *P. onocrotalus*. While thus engaged in collecting, evening drew near, and it became high time to look out for our camp, if we did not wish to become the victims of the "wild army" of mosquitos. Storm clouds rose menacingly from the western horizon, concealing the setting sun. We could not possibly remain upon this lake on account of the smell, and, therefore, rowed through the floating islands to another one. Anxiously, however, as we looked for a suitable dry spot, not one could be found. As soon as we placed foot upon the supposed land, it went under water. A few rain-drops fell; we were wet through already as it was, which is unavoidable on excursions like these, and we began to feel slightly uncomfortable. We rowed rapidly on, looking out for land, for the forerunners of the "wild army" had already begun to appear. At last we found a somewhat firmer and larger island, thickly clad with *Nasturtium* and *Polygonum*. As quickly as possible we opened our mosquito-nets, but before we had finished the blood-thirsty millions appeared, enveloping us and everything around us in dark clouds and tormenting us to death. The agony cannot be described. Under the circumstances we could not think of a layer of rushes to lie upon, and we were thankful when we could creep under the net, which protected us a little at least. We could not be more uncomfortable than we were; we could not move if we did not wish to sink into the water which closely surrounded us. Fortunately the thunderstorm passed away, but we were nevertheless effectually saturated, for—the island sank!

July 18. A night in the Pelican colony! To pass a night of this description requires all the enthusiasm of the naturalist. To be submerged every minute deeper and deeper in stinking water, without daring to move—to have frogs, leeches, and other vermin under and beside you, beleaguered by innumerable humming and buzzing mosquitos, the noise alone is enough to drive one to despair; this is really no pleasure. We therefore felt like being born afresh when, half an hour after sunrise, we could lift up the net and wade to our boats like water-rats. We had not slept a wink—it was really most unpleasant; and it was only after we had rowed for some distance upon the lake and the sun's rays had warmed us a little, that new life returned. We

wanted to see the Pelican colony again in the golden light of the morning sun, to look for some of the finest eggs, to shoot a few young *P. crispus*, and then to bid farewell for ever to the place which had so long kept us in such a state of excitement. We set out accordingly. We only took eggs where a number of putrefying young birds were lying. The feathers on the foreheads of these left no doubt in our minds as to the species. At one shot we got three young *P. crispus*. The young *P. onocrotalus* (in downy plumage), too, was again there. This time we did not let him escape; a well-directed shot brought him down. Thus we again passed several hours in the colony. It may have been about 9 A.M. when we started on our return journey. We did not get to the Cormorants' nests of last year, which are said to stand on the willow-shrubs; our *chasseur* could not find the place again. Of *Larus ridibundus*, which bred about here, not a trace is to be seen. We must mention, however, the innumerable Sea Eagles which we saw here yesterday. For these birds, as well as for the Marsh Harriers, of which we saw numbers everywhere about, there seems to be plenty of food here. A few Purple Herons also appeared. Most plentiful of all was *Anas nyroca*; broken or rather hatched eggs of this duck we found on all the Pelican islands. Of smaller birds we have only to mention *Panurus barbatus* and *Acrocephalus turdoides*, together with some other species of *Acrocephalus*. Thus we quitted this promising breeding-place, satisfied to have found and seen it at all, but less satisfied with our booty, which was hardly adequate. Eggs, of course, we might have carried away by thousands, but we were satisfied with a couple of hundred of them—how many of these we shall be able to blow is a question. We particularly wanted young birds in down and old birds, and these wants were not supplied. The return journey through the reeds was performed quickly, but it was by no means easy. Two hours later we reached the Girda Litkow and found the large boat again, untouched. With difficulty we forced our way through the dense chaos of aquatic plants, rowing with our united strength. The July sun burnt us dreadfully. As before, we rowed in the large boat and tied on one of the small ones behind. In the afternoon we got back to the fishing-hut. This in reality is the only place where one can get a firm footing; and although only a small island, it is at least firm. The old man received us with an

excellent dish of Carp, which was extremely welcome. In spite of feeling completely worn out, we sat down to work immediately under the mosquito-net. An old cask and a plank formed our table, with which we had to be satisfied. The fisherman and his servant soon left for Iuisslin; the boy for Kara-Orman. The latter we commissioned to bring us back some good "wotka" (brandy) to-morrow; one needs it here in these lagoons. Thus we are quite alone at the fishing-hut, far away from all human beings. Towards evening *Sterna hirundo* flies about on the Girda, while the Bearded and Penduline Tits, the Great Reed Warbler, and the Reed Bunting are heard everywhere around.

OCCASIONAL NOTES.

THE 'ALERT' IN THE STRAITS OF MAGELLAN.—The following extracts from a letter addressed to Capt. Feilden by Dr. R. W. Coppinger, Surgeon of H.M.S. 'Alert,' dated Tom Bay, Trinidad Channel, Straits of Magellan, 4th March, 1879, will be read with interest:—"I shall not pack up anything for sending home until our arrival at Valparaiso, where we expect to be in May. I am not collecting the plants here, as they have already been so thoroughly worked out that I should only be losing time, otherwise valuable. Excepting the difference in dialect, the natives of these western channels, extending from the Straits of Magellan to the Gulf of Penas, seem to be in nearly all respects similar to those of the western parts of Terra del Fuego, who have been so carefully described by King and Fitzroy and Darwin. Their general appearance, boats, wigwams, food and manner of living seem to accord closely. They, however, very sparsely populate the wide extent of country which they wander over, and to judge from the number of deserted huts that we encounter, in proportion to those that are tenanted, it would appear that they seldom remain long in the same situation. I do not think they are compelled to adopt this wandering life through a scarcity of their staple diet in any one situation, for mussels and limpets are so abundant about these coasts that in any of the favourite camping grounds—*i.e.*, where a gently sloping beach allows a large extent of foreshore to be exposed at low-water—I should think the supply practically inexhaustible. The animals which they hunt are the Seal and the Otter, and for this chase they are provided with dogs and bone-pointed spears; but, judging from the few skins which they exhibit, and from the small number of bones of the above animals which are to be found in their wigwams, as well as from the few individuals of the Seal and Otter tribes

which we have come across, it would appear that their captures in this way cannot be great. You would be surprised to see how really fat and well nourished these savages are. Their proverbially wretched appearance is due to nakedness, dirt, and shuffling gait, and to their own seemingly innate feeling of human inferiority. Much misconception appears to prevail with reference to the number and species of fish which inhabit these waters, it being commonly supposed that throughout these western channels of the Straits of Magellan region the members of this class are remarkable for their paucity. The truth is that fish are abundant enough, but are rarely to be caught with hook and line, perhaps owing to the abundance of shell-fish which nature provides for their food. However, by means of a trammel-net placed nearly opposite the outlets of mountain streams we have, in most of the places in which we have anchored, succeeded in capturing considerable numbers; so much so as to constitute an item of no mean significance in the dietary of the ship. The hook and line we have now discarded as almost useless. Even the fresh-water lakes are not altogether barren, for quite recently we obtained from a large fresh-water lake, which occupies a mountain basin close to the sea, two species—one a fish about eight inches long, which in general outline and arrangement of fins resembled a Grayling, but was without scales, and the other a small fish something like a Minnow. I have as yet failed to discover any representatives of the Batrachia on the Magellan Islands; but on the opposite shore of the mainland—*i. e.*, on the western slope of the Cordillera—I have found two or three kinds of Frogs, which have, I believe, been already collected by Dr. Cunningham. However, in the discovery of a Rat inhabiting a small islet, distant about fifteen miles from the mainland, I have, I think, added to the list of animals living in these desolate cloud-collecting regions. I trust that I am not wearying your patience by this wordy epistle, which only too plainly displays the paucity of facts which I have as yet collected. Mr. Howard Saunders has asked me to note the distribution, breeding haunts, &c., of the Gulls as carefully as possible. So far we have met with only three species in these channels, viz., *Larus dominicanus*, *L. modestus*?, and a very wary Skua of a dusky brown colour, and barred with white across the wings. This latter I have not yet succeeded in getting within range of. In reading just now, in 'The Times' of the 29th November, Dr. Schliemann's account of his recent excavations at Troy, I notice that he expresses his astonishment at finding immense numbers of the shells of cockles and mussels among the strata of the prehistoric *débris*. He further says, "No doubt they have once been plentiful in these seas, and most probably the Ilians have been eating them; but it remains unexplainable why they left them in the houses instead of throwing them away." It might be interesting to him to know that among the Fuegian tribes who inhabit these regions, and who

live almost exclusively upon mussels and limpets, the practice exists of depositing great numbers of the empty shells on the floor of the huts. They do not cast them away as articles of refuse, but deposit a portion in the centre of the wigwam, and the remainder in a heap at the entrance. In searching the floors of deserted wigwams for relics of native implements I have frequently excavated through considerable depths of empty shells. In Byron's narrative of the loss of the 'Wager' (see Burney's 'Voyages'), he mentions that, when travelling in a canoe with a party of these natives, he once innocently threw the shells of the mussels which he had been eating overboard, and was thereupon attacked by the savages, and but for the intercession of the women would have suffered the penalty of death for his imprudence. He afterwards noticed that his native companions carefully preserved their empty shells in the boat until they reached the shore, when they placed them in a heap above high-water mark. There is no reason whatever to believe that these shells are preserved for any purpose of utility; but what the nature of the superstition may be I have not as yet been able to ascertain."

ROE-DEER IN DORSETSHIRE.—I observe from a note in the April number of 'The Zoologist' (p. 170) that Mr. Dale erroneously considers Ireland and America to have been the original homes of the Roe-deer introduced into Dorsetshire by the late Earl of Dorchester. There is no question about their having been brought to Milton from Scotland. I have heard my grandfather, who was Lord Dorchester's contemporary and next-door neighbour, often say so. The mistake in Mr. Dale's mind as to their Irish origin may possibly arise from Lord Dorchester having estates in Ireland as well as in Dorsetshire. It is quite certain the Roe has not existed in the sister island within historic times, and there is no record of it during the quaternary period, although its remains are found associated with *Cervus megaceros* in the British and continental bone-caves of that period. With regard to America, although it ranges over temperate and southern Europe and Syria, it is not met with in the greater part of Russia, being apparently incapable of survival in high latitudes; hence it never crossed over from the Old to the New World with the Reindeer and the Elk before the submergence of the land at Behring's Straits. These latter are the only two deer common to both continents; but it is right to say that naturalists are undecided as to the identity of the American Caribou and Moose with the European Reindeer and Elk; the impression seems to be gaining ground that they are distinct. In conclusion, I may confidently say that no true capreoline type of deer exists in America. The Rev. O. P. Cambridge, in his note (p. 209), omits to take into consideration that the Roe-deer transferred from this district in 1829 increased and multiplied far beyond the limits of Charborough; for it is

impossible to suppose that the seven and a half brace introduced by Mr. Drax in 1853 could have sufficiently increased in numbers as to give Mr. Radcliffe's hounds the opportunity of killing nearly twenty brace in 1856 and 1857 (after an interval of barely three years)—a death-rate representing more than three times that number which escaped. Mr. Radcliffe's country extended far beyond the purlieus of the Charborough estate, and where, no doubt, the descendants of the first importation had not been extirpated, as had been the case at Charborough. With regard to the number of fawns the doe produces at a birth I can speak with some authority, for living in the metropolis of these little cervines I have frequent opportunities of observation, and I can say without hesitation that the doe "produces two and sometimes three fawns at a time" (p. 121). Her withdrawal from the rest of the family and her isolation at fawning time renders it certain that the fawns seen by her side are her own. Three are not only frequently seen following her, but are found by the keepers in the same lair within a few moments of their birth, and too feeble to escape. Mr. Cambridge corrects my statement by quoting Mr. Bell, who in his first edition (1837) follows Pennant's and Bingley's opinion that two fawns are produced at a time; and the 'Gentlemen's Recreation' (sixth edition, 1721, p. 72), says, "besides some Roe-deer have been killed with five fawns *in utero*."—J. C. MANSEL-PLEYDELL (Whatcombe, Dorsetshire).

CAUSE OF DECREASE OF ROE-DEER: ERRATUM.—In your next number kindly make a slight correction in my communication on Roe-deer, p. 209, line 11 from the top of page. "*The cause*" should be "*one cause*." My illegible handwriting probably misled the printer. The cause mentioned is by no means the *only* cause of the diminishing numbers of our Roe-deer, though it is undoubtedly *one* cause, and one which a little consideration on the part of our sportsmen might easily prevent.—O. P. CAMBRIDGE (Bloxworth).

OTTERS AND BADGERS IN BERKSHIRE.—In a shop in Reading are three stuffed Otters, which were killed at Sandford Mill, on the River Loddon, within the last nine months. The finest is a dog-otter of great length captured during the last long frost, and which I am assured weighed in the flesh twenty-nine pounds eight ounces. This fellow broke away with a twenty-pound trap and chain, and drowned himself. His fur is a deep hair-brown, very handsome. One of my friends saw at Wallingford in April last a pair of fresh-killed Otters, in the flesh, taken from the Thames the same day, a third having escaped. The Badger is still extant in Berkshire. In the woods at Hampstead Norris, near Newbury, a pair of female Badgers were recently dug out of an old chalk-pit. A young male, bagged at the same hole previously, is now in the possession of one of my friends—a somewhat uninteresting pet. He recently slipped his collar, and dug his

way out, but returned the next night. He is a fat and stupid beast, and paid no attention to a Lop-eared Rabbit which I saw hop into his den. More recently a pair of small Badger cubs were dug out in the same district, but unfortunately were destroyed. An old male is still about the woods, and has lately been digging at the disused earths.—H. M. WALLIS (Holmesdale, Reading).

MARTENS IN CUMBERLAND.—On April 12th a female Marten was killed by the hounds on Middlefell, in Wastdale. Its breeding retreat was discovered and two young ones found, still blind, one being considerably larger than the other. The smaller of the two was given to a cat which had lately become a mother, in hopes that she would suckle it, but by the next morning it had disappeared. The next day (April 13th) another fine female was trapped near Dalegarth, in Eskdale. This last, which I saw myself, had a white breast, very faintly tinged with yellow.—CHARLES A. PARKER (Gosforth, Carnforth).

FORMER OCCURRENCE OF THE MARTEN IN ESSEX.—I can add one more to the list of occurrences of the Marten in East Anglia. About 1822 one was killed in the Waltham Woods, near Chelmsford, by the late Mr. Thomas Gopsill, of Broomfield, near Chelmsford. I learn from my father, who had it from the actor, that, seeing something move in a crow's nest, he fired and the Marten rolled out dead. I do not think this can have been a Polecat, an animal which was common at that time and long afterwards, but is not arboreal in its habits. My father remembers seeing five full-grown Polecats killed together in a drain by a terrier near Chelmsford.—H. M. WALLIS (Holmesdale, Reading).

STOAT IN ERMINE DRESS.—On the 3rd March last I saw near here a very beautiful example of the Stoat assuming the ermine dress. It was perfectly white, excepting the black tip of the tail, and an exceedingly regular, oblong, red-brown patch on the middle of the back, looking exactly like a saddle. Being in hot pursuit of a rabbit this Stoat did not notice me. I had therefore, by standing quite still, opportunity of observing it, within a few yards distance, for nearly ten minutes, as it made several casts to pick up the scent.—O. P. CAMBRIDGE (Bloxworth, Blandford).

POLECAT IN BEDFORDSHIRE.—On March 28th a Polecat was killed at Sir George Osborn's seat at Chicksands Priory, and brought to Mr. Wright, of Clifton, to be stuffed. It is reported that another was trapped elsewhere in the county; but I have not been able to get the latter occurrence properly authenticated.—C. MATTHEW PRIOR (Bedford).

BANK VOLE NEAR EXETER.—On the 21st March last Mr. A. Dudley, of Ide, brought me a living specimen of this little rodent, *Arvicola glareolus*

(Schreber), which had been taken in a mouse-trap in his potato-house. His attention was directed to it by its having a white patch on the head. Its reddish colour, smaller size, more slender form, and longer ears readily distinguish it from the Common Meadow Vole. It is the first specimen I have been able to procure, though it has long been recorded as a Devonshire species, on the authority of the Rev. W. S. Hoare, in Rowe's 'Perambulation of Dartmoor.' There are no well-authenticated instances of its occurrence in this county. On presenting a small brush dipped in prussic acid to this example, I was surprised to see it at once commence to lick it, and it, of course, immediately died. An albino rat treated in the same way made frantic efforts to push the brush away from it with its paws, taking up handfuls of its bedding, and using it as a shield to protect its face, and it was only by flicking the poison at it that he succeeded in killing it.—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

ORNITHOLOGICAL NOTES FROM THORPE.—The following notes contain a brief record of birds seen and obtained between November, 1878, and April, 1879, on the Thorpe Mere, near Aldeburgh:—At the beginning of November a few large Black-backed Gulls came into the mere, but a greater number stayed outside in the open sea, with other Gulls and Divers, following the herrings. On the 15th November a fine specimen of the Red-necked Grebe was shot. This is not a very common member of the Grebe family with us. On the 18th December I obtained two Short-eared Owls. On the last day of the old year a fair number of Duck, Teal, and Widgeon came over with a great number of Gulls and a few Knots. On the 2nd January a Sanderling was brought to me. All the birds on the mere seemed to be suffering from cold, and to be in a very starved condition. I saw a strange sight one morning going down to the ice. All the Gulls from the mere had collected in one small garden. One of these birds, apparently on an exploring expedition for food, had found in the garden belonging to a ruinous uninhabited cottage a heap of offal, and some two or three hundred Gulls were soon assembled here. The strongest one (a fine old Herring Gull) stood on the top of the heap making a hearty breakfast, while the others flew round, screeching with anger, and fighting each other to obtain a place near the heap. I watched them for some time, coming quite close, but the birds, tamed by hunger, did not appear to be the least scared at my presence. On the 20th January a Razorbill was washed ashore, just alive, but without any power to help itself, disabled by hunger and cold. On January 25th a Glaucous Gull was shot, as already recorded by me (p. 135), and on the 26th two Scaup Ducks, both males. A large flock of Brent Geese flew over in the following week. On the 4th February a Razorbill was washed ashore dead; on the 24th

a Slavonian Grebe was brought to me, its only peculiarity being its irides, which were yellow; and on the 28th a Goosander. At the beginning of March a few Redshanks appeared; and on the 5th of the same month a Guillemot was washed ashore, having died of starvation. A large number of Brent Geese stayed January and February with us, and towards April a few Bean Geese came over.—F. M. OGILVIE (Sizewell, Leiston).

CORMORANTS ON THE DORSETSHIRE COAST.—Mr. T. M. Pike, writing of the wildfowl in the Poole district (p. 214), says:—“The Green Cormorant, formerly quite a rare bird on our cliffs, has now several stations on the same piece of wild coast line (*i. e.* between Old Harry and Lulworth), and seems likely to become as familiar as his larger brother, the Shag.” I assume that Mr. Pike has good reason for bestowing the name “Shag” on the *larger* of the two British species of Cormorant, *Phalacrocorax curbo* (Linn.), but I have always heard that name applied exclusively to the smaller Green or Crested Cormorant, *P. cristatus* (Faber). My experience also conflicts with that of Mr. Pike in regard to the proportion in which these two species frequent the Dorsetshire coast. When spending a few weeks at Lulworth during the nesting-season of 1865 I made careful observations of the birds that were then breeding on that coast, and estimated that I saw at least twenty of the smaller green “Shags” for every one of the larger Cormorant. The fishermen at Lulworth called them “black shags,” and so common were they along that coast that on throwing a stone down from the top of a cliff we frequently saw twenty or thirty of them fly out to sea. This was nearly fifteen years ago, and things may have altered since then. It is curious, however, if the proportion in numbers is now reversed, and the Great Cormorant is now the commoner species. Can it be that the larger bird, by usurping the best nesting-places, has gradually driven its smaller congener away, in the same way as the Jackdaw on some parts of the coast has banished the Chough? Mr. Pike will find my notes on the two species, as observed on the Dorsetshire coast, in ‘The Zoologist’ for 1865, pp. 9674, 9675.—J. E. HARTING.

RING OUZEL WINTERING IN ENGLAND.—I am much interested in your article on the Ring Ouzel (p. 203). You have certainly proved that a few remain sometimes with us through the winter, but I hardly think you have proved them entitled to be called “residents,” a term I conceive that ought only to be applied to those species that remain regularly with us every year. I think, too, they ought hardly to be classed with the Pied Wagtail and Meadow Pipit, numbers of which remain all the year, but rather with the Wheatear and Landrail, which have frequently been found at uncertain intervals in the winter months. The very fact of several people writing to you on the subject proves that they thought the occurrence of these birds in winter unusual; but out of the six counties where they

are said to have wintered, I venture to remark that two (Norfolk and Salop) ought to be struck off; for though, in Norfolk, they were seen in severe frost, that frost might have been early in November, before they had all migrated; and, in Salop, my bird might have been wounded, or may have migrated after I saw it. At any rate I never saw it again, nor have I seen any others all the winter since, though I have kept a sharp look out. In the autumn of 1877 the crop of mountain ash and hawthorn berries was very abundant and the weather very mild, but the Ring Ouzels only stayed ten days later than their usual time, with the exception of two, and those I saw for the last time on the 2nd December. As far, therefore, as this county is concerned, I think they must be considered summer migrants, occasionally, but rarely, stopping till late in autumn, perhaps even through the winter.—WILLIAM E. BECKWITH (Eaton Constantine, Salop).

RING OUZEL NESTING IN ESSEX.—My friend Mr. C. E. Bishop, of Wickham, Essex, tells me that on the 10th May he found a Ring Ouzel sitting upon four eggs in that parish. The nest he describes as placed almost upon the ground among rough herbage, about a foot from the edge of a ditch, and a few yards from the River Blackwater. The eggs he describes as more boldly spotted than is usual with Blackbird's. Only the hen bird has been seen, and she is—or was lately—still sitting. I may add that Mr. Bishop has collected eggs and observed birds from childhood, and is not likely to be mistaken.—H. M. WALLIS (Holmesdale, Southern Hill, Reading).

SONG OF THE RING OUZEL.—If I do not err, the song of the Ring Ouzel has not been often, if ever before, noted in the South of England. It was therefore an unexpected pleasure to me to hear it lately (April 18th), without any possibility of mistake. I was walking along the lane between Bloxworth and Winterbourne Tomson, and on the top of a not very high solitary tree were two birds, one of which was singing away merrily. The shelter of the hedge enabled me to get almost underneath the tree unobserved, when, to my surprise, the birds proved to be a pair of Ring Ouzels. The male continued to sing until some minutes after, when, disturbed by my movements, they both flew to another tree about fifty yards off, where the song was immediately resumed. If I had not proved the bird singing to be a Ring Ouzel I should have unhesitatingly concluded it to have been a Blackbird; its notes were equally full and mellow, but with rather less compass, and not quite so much variety in the strain.—O. P. CAMBRIDGE (Bloxworth, Blandford).

SLAVONIAN GREBE IN BEDFORDSHIRE.—A specimen of the Slavonian Grebe was shot near Bedford during the last week in February. It was an adult bird in perfect winter dress.—C. MATTHEW PRIOR (Bedford).

ROOKERIES OF LONDON.—The rookery in Kensington Gardens has increased from thirty-one nests last year to fifty this year. The little colony in the Deputy Ranger's Grounds, Hyde Park, is deserted; only two nests remain, and they are not tenanted. There are sixteen nests in the plane trees in Brunswick House Gardens, New Road; and eight nests in two plane trees behind Nos. 10 and 8, Upper Wimpole Street. The colony in the garden in Gower Street has increased from three to five nests.—EDWARD HAMILTON (9, Portugal Street, Grosvenor Square).

ROOKERIES OF LONDON.—The Rooks' nests, which have for years been frequented each spring, in the trees near Hereford Square, Old Brompton, are this year deserted by the old birds, much to the regret of many inhabitants. The noise of the workmen on the numerous buildings that are being erected in the vicinity is doubtless the cause of their going away. This is much to be lamented, as they are so interesting in their habits, and so cheerful in towns.—LAMBTON YOUNG.

EARLY NESTING OF THE WATER RAIL.—It may be worth recording that on the 8th April a nest of the Water Rail, *Rallus aquaticus*, containing nine eggs, was taken in East Norfolk. These eggs, which I received unblown, were slightly incubated, and it strikes me as being an unusually early date at which to find incubation with this species so far advanced.—A. H. EVANS (Clare College, Cambridge).

HOOPOE IN FIFESHIRE.—A male specimen of the Hoopoe was shot by the under-keeper to Mr. Baird, of Elie, at Elie House, Fifeshire, on the 8th May. The specimen, which has been preserved by Mr. Small, of this city, is in very fine plumage. The occurrence of the Hoopoe at this season in Britain is very unusual.—J. J. DALGLEISH (8, Atholl Crescent, Edinburgh).

[This may be so in North Britain, but not in the South of England, where the Hoopoe is an annual spring visitant.—ED.]

GREAT SPOTTED WOODPECKER IN PERTHSHIRE.—I have to record the occurrence, in the south-west of Perthshire, of an adult female Great Spotted Woodpecker, at Donne Lodge, the seat of the Earl of Moray, on the 24th April last.—J. H. BUCHANAN (Leny, Callander, N.B.).

[This bird is a well-known winter visitant throughout Scotland, and specimens have been obtained in almost every county. On the east coast within the last few years it has become rather common. See Gray's 'Birds of the West of Scotland,' p. 190.—ED.]

FIELDFARES IN MAY.—On May 5th I saw near here a considerable flight of Fieldfares. This is the latest date I have recorded, during the last twenty-five years, of their being seen in this neighbourhood. The nearest to it occurred in 1872, when I observed some, in company with Redwings, on the 25th April. On the present occasion, however, there were, so far as I could see, no Redwings.—O. P. CAMBRIDGE (Bloxworth, Blandford).

BOAR-FISH AT TORQUAY.—Mr. Penny's mention of the occurrence of the Boar-fish on the Dorsetshire coast (p. 221) leads me to state that two living specimens of the same species were taken in the inner harbour, Torquay, on the 24th February last. One of the specimens is now in the Museum of the Torquay Natural History Society.—W. PENGELLY (Torquay).

BOAR-FISH AT EXMOUTH.—When at Exmouth, on the 24th April last, I was shown two specimens of the Boar-fish, *Capros aper*, about five inches in length, which had been taken in a net on the previous day just outside the "bar"—a long reach of sand-banks covered at high-water. I purchased them for this Museum. They are the first specimens which have ever been taken at Exmouth, so far as I can ascertain. It is remarkable that so many examples of this fish should have occurred at the end of last March on the Dorsetshire coast, so far from its usual habitat, which, according to Couch, is close to the Runnel Stone, near the Land's End.—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

May 6, 1879.—Professor W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of April, and called special attention to two Lanceolated Jays, *Garrulus lanceolatus*, from the Himalayas, and two Siberian Roe-deer, received in exchange. The Secretary also announced the arrival of a Japanese Goat-Antelope, *Capricornis crispus*, presented by Mr. H. Pryer, of Yokohama; and of an Alpine Accentor, *Accentor alpinus*, received in exchange, being, it was believed, the first example of this little bird seen in captivity.

A letter was read from Mr. E. L. Layard, relating to the localities of certain species of Fruit Pigeons (*Ptilopus*) of the South Pacific Islands.

Prof. Flower exhibited and made remarks on a drawing of a British Cetacean, *Delphinus tursio*, taken from a specimen captured near Holyhead in 1878.

A communication was read from Mr. Gerard Krefft, giving the description of a supposed new form of insectivorous Bat, of which a specimen had been obtained on the Wilson River, Central Queensland.

The Rev. Canon Tristram read a description of a new species of Woodpecker, from the island of Tyzu Sima, near Japan, which he proposed to name, after its discoverer, *Dryocopus Richardsi*.

A communication was read from Mr. F. Moore, containing the descriptions of new genera and species of Asiatic Lepidoptera Heterocera. Eleven new genera were characterized and ninety new species described.

Mr. G. French Angas read the descriptions of ten new species of shells of the genera *Axinæa* and *Pectunculus*.

A communication was read from Mr. W. A. Forbes, on the anatomy of the African Elephant, based on facts observed during a dissection of a young female of that species during the last winter. The structures of the thoracic, alimentary and urino-genital viscera of this species were described, and compared with the previously published accounts of those of both the Indian and African species of Elephant. The most important differences observed were those displayed in the liver and female organs; but on the whole were not of such a nature as to make it advisable, in the author's opinion, to separate *Loxodon* as a genus from *Elephas* proper.

A paper was read by Mr. F. Jeffrey Bell, on the question of the number of anal plates in the Echinoderms of the genus *Echinocidaris*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

April 2, 1879.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the chair.

Mr. M'Lachlan exhibited the cases and sixteen species of Brazilian caddis-flies, with the insects bred from the larvæ that manufactured some of them, sent to him by Dr. Fritz Müller, from Santa Catharina. Included were the cases exhibited at the meeting of the 4th December last.

In connection with the habits of the Mantidæ—a subject which had been recently brought under the notice of the Society by Mr. Wood-Mason and others—Mr. Stainton remarked that on March 20th, 1866, he received a letter from Mr. Moggridge, jun., stating that he had forwarded a caterpillar "and also a curious grasshopper(?)." The latter was enclosed in a box, from which, on being opened, there jumped out a little creature which he had no difficulty in recognising as a young *Mantis*. It was of a whitish green colour, and may possibly have been the young larval form of *Mantis religiosa*. It was placed back in the box, and the next morning again examined, the long anterior segment of the thorax and the peculiar anterior legs leaving no room for doubt that the specimen, in spite of its hopping movements, was a young *Mantis*. It was again turned out of the box, and again made little jumps, not such springs as would be taken by a grasshopper, but still there was that in its movements which quite justified Mr. Moggridge, who, although a first-rate botanist, has not yet turned his attention to Entomology, in styling it "a curious grasshopper(?)." De Geer observes (vol. iii., p. 401) that "les *Mantes* approchent beaucoup des Sauterelles, quoiqu'elles ne puissent pas sauter." Mr. Stainton was of opinion

that this peculiar motion of the baby *Mantis* is one of those cases to which Mr. Darwin has called attention, *viz.*, that the relationship and affinities of animals are often more expressed in the embryonic than in the adult form.

Sir Sidney Saunders exhibited a bag, said to be the production of a large species of spider, brought from the Fiji Islands by Mr. Henry Selfe, engineer on board a steamship trading between those islands and New Zealand. A similar specimen is said to be in the Auckland Museum. The natives are stated to split bamboos and to place the pieces in the form of a bag in the track of the spiders, and when covered by these the slips of bamboo are drawn out. It is believed that the natives make cloth of these webs. This information was obtained from another Englishman who had resided four years in these islands.

The Chairman pointed out that, supposing subsequent inquiries to confirm these statements, this would probably be the first known case of an articulate animal being made to manufacture *directly* a fabric useful to man.

The Secretary read the following note by Mr. J. W. Slater, "On Insects destroyed by Flowers":—

"Whilst it is generally admitted that the gay coloration of flowers is mainly subservient to the purpose of attracting bees and other winged insects, whose visits play so important a part in the process of fertilization, it seems to me that one important fact has scarcely received due attention. Certain gaily-coloured, or at least conspicuous, flowers are avoided by bees, or if visited have an injurious and even fatal effect upon the insects. Among these are the dahlia, the passion-flower, the crown-imperial, and especially the oleander. That the flowers of the dahlia have a narcotic action both upon humble-bees and hive-bees was first pointed out, I believe, by the Rev. L. Jenyns, in his 'Observations in Natural History' (p. 262). He mentions that bees which visit these flowers are 'soon seized with a sort of torpor,' and often die unless speedily removed. He quotes also a writer in the 'Gardener's Chronicle,' who pronounces the cultivation of the dahlia 'incompatible with the success of the bee-keeper.' I find it also recorded that the passion-flower stupifies humble-bees; that bees of all kinds avoid the crown-imperial and the oleander, and that the honey of the latter is fatal to flies. I cannot call to mind that I ever saw a butterfly or a moth settled upon the flowers of this shrub in Hungary and Dalmatia, where it is very abundant. It seems not unimportant to ascertain whether the above-mentioned phenomena have been verified by other observers; whether any other insects, in such cases, undertake the functions generally exercised by bees, and whether other flowers have a similarly noxious or deadly action upon insects."

The Secretary also read a paper communicated by Miss E. A. Ormerod, entitled "Observations on the Effects of Low Temperature on Larvæ," in

which the authoress comes to the conclusion that of all the species belonging to different Orders examined during the severe frosts of the past winter, none were materially injured by the low temperatures to which they were subjected. Specimens in illustration of the paper were exhibited.

Mr. Stainton remarked that although he fully agreed with Miss Ormerod that insects did not suffer directly from cold, yet he knew of two instances during the past winter in which a great loss of insect-life had ensued, owing to the leaves tenanted by mining larvæ having been killed by the severe frost. It was the habit of the larva of *Lithocolletis messaniella* to feed up during the winter months in the leaves of the evergreen oak (*Quercus Ilex*), and the effect of the extreme cold had been to kill the leaves of many trees of *Q. Ilex*, which were now quite leafless, although others similarly placed seemed to have escaped unhurt. Where a leaf containing a mining larva had been killed, the latter, unless capable of quitting the leaf to seek fresh food,—a power which no larva of the genus *Lithocolletis* possessed,—had necessarily died of starvation. On those trees of *Q. Ilex* which had escaped injury from the cold, Mr. Stainton had found that these larvæ were much less developed than was usual at this period of the year, and hence he anticipated that the moths which should appear at the end of April would be delayed beyond their usual time. The other instance he had noticed was that of the larva of *Tischeria marginæa*, which fed up during the winter months in the leaves of the bramble; in the neighbourhood of Lewisham almost every leaf of bramble had been totally killed by the frost, and of course the in-dwelling larvæ had perished for lack of food.

Mr. M'Lachlan stated that it was generally believed that wet winters were far more destructive to insect-life than dry cold ones, however severe.

Mr. W. Cole asked whether the insects observed by Miss Ormerod were actually frozen throughout, since it seemed to him improbable that the vital fluids in the tissues could be solidified without causing death. It was known that when the protoplasm of the leaves of trees was actually frozen the leaves were killed.

Miss Ormerod stated that some of the larvæ observed by her enclosed in frozen earth were in a state of brittleness when taken out, but nevertheless recovered on being thawed.

Mr. M'Lachlan was of opinion that animals might be frozen throughout into a state of perfect rigidity, and yet recover when thawed. He instanced the case of a fish which had been found in this condition imbedded in ice, and which had recovered on thawing.

Mr. W. L. Distant communicated a paper containing "Descriptions of new Species of Hemiptera collected by Dr. Stoliczka during the Forsyth Expedition to Kashgar in 1873-74," to form portion of the general work on the scientific results of the Expedition, now in course of publication at Calcutta.—R. MELDOLA, *Hon. Secretary*.

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THE BIRDS OF LONDON:

PAST AND PRESENT, RESIDENTS AND CASUALS.

By EDWARD HAMILTON, M.D., F.L.S.

IN the latter part of the reign of George the First, General Oglethorpe, who died in 1785, and his friend Carew Mildmay shot Woodcocks and Snipe in the open fields around Hanover Square. A conduit took its rise at the Lord Mayor's Banqueting House, now Stratford Place (where his lordship formerly proceeded to hunt the hare before dinner and the fox after), flowed across Oxford Street, by Hanover Square, Conduit Street, Berkeley Square, Hertford Street, to the top of what then was St. James's Park (now the Green Park), into a large reservoir for supplying St. James's Palace with water. Maitland, writing in 1732, says there was no house above Tyburn Road. Montague House and Southampton House, only pulled down at the beginning of the present century, had each its ample garden, in which the Nightingale and other summer warblers gladdened the ears of the passers by with their melody. Thrushes and Blackbirds, whose descendants now remain in Russell and Bedford Squares, frequented the hedgerows of the pastures where now stands Upper Montague Place, then the "Field of Forty Footsteps," where the maiden watched the fatal duel between her two brothers. The present St. Giles's Church was only built in 1734, and was surrounded with high elm trees, where built Rooks, Magpies and Kites; the village pound was only removed in 1768. Ely House, Holborn, with its garden so famous for strawberries,

had its maze and wilderness full of small birds. The Fleet-ditch, formerly called "Turnmill-brook," was a clear and rapid stream frequented by the Kingfisher and various water-fowl. Boats could come up to Holborn Bridge, and fish were caught there, possibly Salmon and Trout, for we know the river Thames was full of them. Maitland says, "How remarkably good are its Salmon! what fine large Flounders! what Smelts, Trout, Grayling, Tench, Barbel, Chub, Roach and Dace!" And no doubt the large gardens of the mansions of the nobility on the banks of the Thames were as full of the different feathered songsters of the grove as the river was of fish. The fields where now stand Belgrave and Eaton Squares and the surrounding streets were but a few years ago frequented by Wild Geese and Ducks, Plover and Snipe. Every house in that neighbourhood had its duck-gun, and the quiet sequestered gardens of Cadogan Place was a well-known resort of the Nightingale and Blackcap.

Alas! the birds of London are fast diminishing in numbers. The great increase of buildings and other causes drive them to the outskirts, where they may still be found. We propose to give a short account of those left as residents, as well as of those which casually visit us on their way to "fresh woods and pastures new;" and few would suppose that we should be able to enumerate no less than ninety-three species, and there may be many others. Some idea of the number of birds in Hyde Park in 1799 may be gained from what occurred during a review held there in that year by King George on the occasion of his sixty-second birthday. The papers of the day relate that "the troops reviewed were 841 cavalry and 7351 infantry, and that during their evolutions several thousands of small birds flew alternately from the noise of the troops towards the verge of the circle of spectators, from whence they returned terrified to the troops, and *vice versâ*, till they became so exhausted that some of them fell motionless to the ground."

PEREGRINE FALCON, *Falco peregrinus*.—A casual visitor. For many years a pair of these birds frequented the top of St. Paul's Cathedral. The late Sir John Sebright, my informant, stated that they could always be seen there during the month of October, attracted, no doubt, by the numerous Pigeons frequenting the different porticos and steeples of the churches.

KITE, *Milvus regalis*.—A rare casual visitor. Formerly one of the scavengers of the city; numerous Kites built in the trees around and in London. In 1859 a Kite was observed flying over Piccadilly, not above one hundred yards high.

KESTREL or WINDHOVER, *Falco tinnunculus*.—A casual visitor. In April, 1871, a pair of Kestrels had a nest in the cable attached to the anchor on the summit of Nelson's Column, Trafalgar Square. A few years since a pair frequented Primrose Hill, where they might have been seen early in the morning. Mr. E. Bartlett (Proc. Zool. Soc., 1863) records its appearance in the Zoological Gardens, Regent's Park.

SPARROWHAWK, *Accipiter nisus*.—A casual visitor. Occasionally seen, and will swoop at the cage-birds as he passes along.

BARN OWL, *Strix flammea*.—A casual visitor. Mr. E. Bartlett (Proc. Zool. Soc., 1863, p. 159) records the Barn Owl as having been observed in the Zoological Gardens, Regent's Park.

GREAT GREY SHRIKE, *Lanius excubitor*.—A casual visitor. Although not having been seen in the London Parks, yet one was caught in the immediate precincts:—"April, 1840. A Great Grey Shrike was caught last month on Hampstead Heath in the clap-net of a birdcatcher, the Shrike having stooped at the call-bird. It was bought by the Zoological Society, and is now in the Gardens." Prof. Newton (Yarrell's Brit. Birds, 4th edit.) states that another caught in the same manner "was readily parted with by its possessor, who found that its note, once heard, stopped the song of all his other birds."

SPOTTED FLYCATCHER, *Muscicapa grisola*.—A summer resident. Mr. Bartlett (*l. c.*) records the nesting of this bird in the Zoological Society's Gardens. They regularly nest and rear their young in Kensington Gardens and Hyde Park. A pair had a nest in Hamilton Gardens, Park Lane, in 1878; another pair in the shrubbery at the head of the Serpentine. The nest was placed about twelve feet from the ground on the stump of a branch which had been lopped. There were also two nests in Kensington Gardens close to the Broad Walk.

MISSEL THRUSH, *Turdus viscivorus*.—Resident. Two or three pairs constantly frequent and breed in Kensington Gardens. In 1876 a pair had their nest in the plane tree in Hamilton Gardens, Park Lane. The Regent's and Battersea Parks are other localities. It is an early songster; often in full song in February, before

stormy weather, hence the name of "Storm-cock." Spenser, in his 'Epithalmion,' line 77 *et seq.*, evidently designates this bird as the Thrush:—

"The merry Lark her mattins sings aloft;
The Thrush replies; the Mavis descant plays;
The Ouzel shrills; the Ruddock warbles soft."

FIELDFARE, *Turdus pilaris*.—Mr. Bartlett has observed Fieldfares in the Regent's Park. They may be seen occasionally every winter. My notes record:—"Dec. 27, 1878. Fieldfares in Hyde Park; fog and rime frost, very cold." "Jan. 3, 1879. A flock of Fieldfares in Hyde Park, on the old Exhibition ground; very cold, frosty weather; birds very tame, appear half-starved." Mr. Bartlett informs me that many Fieldfares and Redwings were picked up during the severe weather of the last winter, 1878-9, so exhausted from starvation and cold that they were unable to fly; he took many of them into his house, fed them for a day or two, and then set them at liberty.

REDWING, *Turdus iliacus*.—A casual visitor. Notes from journal:—"April 4, 1875. Flocks of Redwings and Fieldfares passing over Hyde Park; a fine sunny morning; a few Redwings remained in the elm trees for a time, some of them singing a soft melodious note." "Dec. 23, 1878. A flock of Redwings feeding in Hyde Park." "Jan. 9, 1879. A great many Redwings in Hyde Park."

SONG THRUSH, *Turdus musicus*.—Resident, and plentiful in all the parks, gardens and squares, where it both sings and breeds. The song may be heard early and late in the spring months, a fact not unnoticed by the poets. Thus Drayton, in his 'Polyolbion':—

"The Throstle, with shrill sharps, as purposely he song
T' awake the listless sun, or chiding that so long
He was in coming forth."

And Burns:—

"The Mavis wild, wi' many a note,
Sings drowsy day to rest."

BLACKBIRD, *Turdus merula*.—Resident, and, like the Thrush, to be found in all the parks, gardens and squares, where it nests regularly and pours forth its sweet, clear notes. Its yellow bill,

contrasting so well with its black coat, always makes this bird a conspicuous object. Shakespeare calls it—

“The Ouzel-cock, so black of hue,
With orange-tawny bill.”

And Drayton :—

“The Woozel near at hand that hath a golden bill.”

RING OUZEL, *Turdus torquatus*.—A rare casual. Seen occasionally on migration in the Regent's Park (Bartlett, Proc. Zool. Soc., 1863), and Yarrell has recorded one being caught in a trap in a garden at Lambeth.

HEDGESPARROW, *Accentor modularis*.—Resident, and not uncommon, breeding in our parks and gardens. There was a nest last year in Hamilton Gardens, Park Lane.

REDBREAST, *Erythaca rubecula*.—Resident. This universal favourite, the earliest bird in the morning and latest at night, is heard in all our parks and gardens, but, curiously, it is much shyer in London than in the country; although it may be found in almost every small shrubbery in Kensington Gardens, it keeps at a distance, and allows no near approach. Its song enlivens us almost all the year; even in winter, when all other birds are mute, it still sings on. The Robin has been the theme of many a poet, and few lines are more beautiful than Rogers's ‘Epitaph on a Robin Redbreast’ :—

“Tread lightly here, for here 'tis said,
When piping winds are hushed around,
A small note wakes from under ground,
Where now his tiny bones are laid;
No more in lone and leafless groves,
With ruffled wings and faded breast,
His friendless, homeless spirit roves;—
Gone to the world where birds are blest,
Where never cat glides o'er the green,
Or schoolboy's giant form is seen,
But love, and joy, and smiling spring
Inspire their little souls to sing.”

NIGHTINGALE, *Daulias lusciniæ*.—A casual visitor. Some few years back this “sweetest songster of the grove” would have been placed amongst the regular summer visitants to London. Not many years since, amongst the favourite resorts of this bird

were the shrubberies in Cadogan Gardens, Sloane Street, and in Kensington Gardens; and although Mr. Harting, in his '*Feræ Naturæ* of the London Parks,'* states that several naturalists have heard this bird within the last two years in the flower walk of Kensington Gardens, the writer, although on the watch both early and late, has not detected its song or seen it there since 1872. The shrubberies are now too tidy to attract it. The Nightingale delights in thick undergrowth, low coppices and hedgerows. Formerly such localities existed in the above-named places, and the song of this bird was then constantly heard. Within a few years the Nightingale frequented the low bushes and thick shrubberies on the banks of the Canal in the Regent's Park, and is still occasionally heard there. This year it is pleasant to record its advent again. On Sunday, April 29th, one was singing close to the Gardens of the Zoological Society. Travers, the Keeper of the Western Aviary, drew my attention to it, and we listened for some time to its song, "most musical, most melancholy." This bird, amongst poets of all ages, is designated as in the feminine gender, in allusion, no doubt, to its mythological origin. It is always referred to as "she" or "her," although it is the male bird alone which sings. Spenser is one of the few poets who places the Nightingale in the masculine gender; thus, in the '*Shepherd's Calendar*':—

" The Nightingale is sovereign of song,
Before *him* sits the Titmouse, silent be."

Skelton, poet laureate to Henry the Eighth, wrote:—

" It were an heuenly helthe,
It were an endlesse welthe,
A lyfe for God himselfe,
To here this Nyghtyngale,
Amonge the byrdes smale,
Warbelynge in the vale,
Dug, dug, Iug, Iug,
Good yere and goode lucke,
With chuke, chuke, chuke, chuke."

Not every poet, however, who has written in praise of the Nightingale has proved himself acquainted with its song. Cowper, for instance, wrote a poem to the Nightingale, which he

* '*Popular Science Review*,' April, 1879.

thought he had heard sing on New Year's Day, 1792, but there can be no doubt that he listened to a Thrush.

REDSTART, *Ruticilla phœnicurus*.—A summer visitant. Formerly not uncommon, but now scarce. In 1876 I noticed a pair of Redstarts in Kensington Gardens. It has been observed in the Regent's Park.

WHEATEAR, *Saxicola œnanthe*.—A casual visitor in spring and autumn. "April 5, 1878. A Wheatear, female, in Hyde Park near the Barracks." The same spring a writer in 'The Times' stated that he had seen five "Golden Orioles" in the park! These proved to be Wheatears.

REED WARBLER, *Salicaria arundinacea*.—A summer visitant. Mr. E. Bartlett states that this bird breeds in the Zoological Gardens; but it has not been seen there for the last two or three years. It also breeds, according to Mr. Henry Smith, in the Botanical Gardens, Regent's Park, where, in the nest of one of these birds, he one year discovered a Cuckoo's egg.

SEDGE WARBLER, *Salicaria phragmitis*.—A casual summer visitor. Recorded as seen in the Regent's Park.

The **GREATER WHITETHROAT**, **LESSER WHITETHROAT** and **GARDEN WARBLER** are all casual summer visitants to the London parks and gardens, and are not unfrequently observed in the Regent's Park.

BLACKCAP, *Sylvia atricapilla*.—Also a summer visitant. It breeds in the Zoological Gardens (Bartlett), and one or two pairs are to be found every summer in Kensington Gardens. A small shrubbery near the round pond was always tenanted by a pair of these birds. This shrubbery, alas! having been made "beautiful for ever," the birds have departed. The flower walk is another locality; also the gardens behind Prince's Gate.

The **WOOD WREN**, **WILLOW WREN** and **CHIFFCHAFF** are all spring visitors to the London parks and gardens. The last-named may be often heard in the gardens in Belgrave Square.

GOLDEN-CRESTED WREN, *Regulus cristatus*.—A casual visitor, and has been noticed in the Zoological and Botanical Gardens, Regent's Park, and in Queen Square, Bloomsbury.

TREE CREEPER, *Certhia familiaris*.—A casual visitor. Formerly a resident in Kensington Gardens. One noticed in these gardens in 1877.

NUTHATCH, *Sitta cæsia*.—Now a casual visitor. A few years

since, this bird was a constant summer resident in Kensington Gardens, and occasionally it returns to its old habitat. A pair were observed in the gardens last year.

GREAT TITMOUSE, *Parus major*.—This familiar bird is a regular winter visitor to our parks and gardens. Skelton wrote:—

“ I have a pretty Tytmouse
Come pecking on my to.”

And Drayton notices

“ Mistress Tytmouse, a neat, merry dame.”

BLUE TITMOUSE, *Parus cæruleus*.—A casual visitor. Some of these busy little birds generally visit our parks and gardens in spring and autumn.

COAL TITMOUSE, *Parus ater*.—Perhaps to be found more frequently than the preceding, and is usually seen during the summer months. There were two pairs on the 23rd April last in the flower walk, Kensington Gardens.

MARSH TITMOUSE, *Parus palustris*.—A casual visitor. Reported by Mr. Bartlett as seen in the Zoological Gardens.

LONG-TAILED TITMOUSE, *Parus caudatus*.—A casual visitor.

PIED WAGTAIL, *Motacilla Yarrellii*.—This bird visits our parks and gardens in spring and autumn, only remaining a few days. At the end of March and beginning of April two or three may be seen on the banks of the Serpentine, in early morning, searching for the larvæ of aquatic insects. Note:—“ March 25, 1878. Pied Wagtail by the Serpentine, very busy searching for food.”

GREY WAGTAIL, *Motacilla boarula*.—A casual visitor. Noticed by Mr. Bartlett in the Regent's Park.

RAY'S WAGTAIL, *Motacilla Rayii*.—The same remarks apply.

TREE PIPIT, *Anthus arboreus*.—Five and twenty years ago the Tree Pipit was a regular summer visitant in Hyde Park; now this species and the MEADOW PIPIT, *A. pratensis*, are rarely seen. Recorded by Mr. Bartlett as occurring in the Regent's Park.

SKY LARK, *Alauda arvensis*.—The Sky Lark was once a resident both in Hyde Park and the Regent's Park, and its joyous song might be usually heard during a morning walk. In ‘The Times’ of February 2nd, 1857, was the following notice:—

“ EXTRAORDINARY FLIGHT OF LARKS.—I have just returned from a stroll in the Regent's Park,—1 o'clock p.m., Saturday, January 31, 1857,—

where I witnessed a very unusual spectacle. When about one hundred yards from the railing of the late Mr. Holford's grounds, I was brought to a stand by observing an immense flight of Larks coming over the Zoological Gardens and making for the late Marquis of Hertford's (this is from N.E. to S.W.). Their numbers were countless, and they literally darkened the air. They were flying very low, and were obliged to divide in order to pass me on either side. This flight took two or three minutes to go over, and after a brief interval was succeeded by another almost as numerous. Being curious to observe whether it would continue, I remained on the spot for upwards of an hour, during which time flight after flight passed near me, sometimes in detachments of a few hundreds at a time, sometimes in myriads. One of the flights settled almost within shot and covered the ground, within a few inches of each other, for the space of half an acre. The unusual sight attracted the notice of one of the park keepers and of several others. How long they may have been passing I cannot say. I only know when I left the cry was 'still they come.'

A similar occurrence was observed in Hertfordshire in 1842. Thousands of Larks commenced passing over, flying low, in flocks of many hundreds at a time, from daybreak to sunset, all following the same course, going from N.E. to S.W., and uttering a low chirp. On the next day a deep snow set in.

There is scarcely an English poet, from Chaucer to the present time, who has not sung the praises of the Lark. As Professor Newton truly says, "a volume might be filled with extracts describing it or alluding to its habits."

COMMON BUNTING, *Emberiza miliaria*.—A casual visitor. Has been observed in the Regent's Park.

CHAFFINCH, *Fringilla cœlebs*.—May be regarded as a resident. It breeds in Hyde Park. In 1878 there was a nest in a tree over the most fashionable lounge, where for two or three hours every day crowds of gaily-dressed people are sitting, walking, and talking. It also breeds in Kensington Gardens, Battersea Park and the Regent's Park. It has been noticed as a casual visitor in Queen Square, Bloomsbury, and in Gray's Inn Square.

In the older writers, the Chaffinch is called "Spynke," no doubt from its note. Skelton, in his "Death of Philip Sparow," refers to—

"The Lark with his long to,
The Spynke, and the Martynet also."

In the 'Countrie Farme' (ed. 1600), the "Spinke" is frequently mentioned, and in the French work by Estienne and

Liebault, from which it is translated, the corresponding word is "*pinçon*." In Cotgrave's 'Dictionary' we find "*Pinson*, a Spink, Chaffinch, or Sheldpate;" and in More's 'Suffolk Words,' "*Spink*, the Chaffinch." R. Nicolls, in a poem called 'The Cuckowe' (1607), has—

"The speckled Spinck that lives by gummie sappe."*

The common name for the Chaffinch in Middlesex and Hertfordshire is "Pink" or "Spink."

HOUSE SPARROW, *Passer domesticus*.—What should we Londoners do without our Sparrow? His cheerful voice and familiar presence enliven our hours, and although a fearless bird, yet he is "wide awake," and will not allow too near an approach. He is indeed a London bird. Go to what part of London you will, you will find "Philip Sparrow," equally familiar with rich and poor, building his nest and rearing his progeny in the very depths of the purlieu of St. Giles's as well as in the Corinthian columns of the aristocratic houses of Belgrave Square, while Sparrow fights are as frequent amongst the dense rows of the squalid houses as in the more fashionable precincts. He has ever been a favourite, particularly with our older poets. Skelton wrote an "Elegy on the Death of a Pet Sparrow":—

"To wepe with me, loke that ye come,
 All manner of byrdes, in your kynde,
 Se none be left behynde.
 To mornyng loke that ye fall
 With dolorous songs funerale;
 Some to synge and some to say,
 Some to wepe, and some to pray,
 Every byrde in his laye;
 The Goldfynche, the Wagtayle,
 The janglynge Jay to rayle,
 The fleckyd Pye to chatter
 Of this dolorous matter,
 And Robyn Redbrest,
 He shall be preest
 The requiem mass to synge,
 Softly warbelynge.

* * * * *

The Hobby and the Muskette
 The sensers and the cross shall get;

* See Dyce's notes to Skelton's Poems.

The Kestrel in all this warke
 Shall be the holy-water clarke.
 Our chanters shall be the Cuckowe,
 The Curlei and the Stockdowe;
 With Peewyt, the Lapwing
 The versycles shall syng.
 The Swan of Menander,
 The Gose and the Gander,
 The Ducke and the Drake,
 Shall watch at his wake."

Gascoyne, too, has a sonnet in praise of "Philip Sparrow," the familiar name by which this bird is known, from his note, commencing thus—

"Of all the birds that I doo know,
 Philip, my Sparrow, hath no peere;
 For sit she high or lye she low,
 Be she far off or be she neere,
 There is no bird so faire, so fine,
 Nor yet so fresh as this of mine."

Many doubtless are familiar with a beautiful engraving of "Lesbia and her Sparrow," after a picture by Sir Joshua Reynolds, suggested by the poem by William Cartwright:—

"Tell me not of joy; there's none
 Now my little Sparrow's gone;
 He, just as you,
 Would toy and wooe;
 He would chirp and flatter me.
 * * * * *
 Then would hop and then would run,
 And cry Philip when h' had done.
 * * * * *
 Now this faithfull bird is gone,
 O let mournful Turtles joyn,
 With loving Redbreasts, and combine,
 To sing dirges o'r his stone."

In London the Sparrow is a very early breeder. I have the following notes:—"Feb. 22, 1877. Sparrows building nest, nearly complete, in a Virginian creeper at No. 6, The Terrace, Kensington." "March 2, 1878. Sparrows building in the ivy of the gardener's house, Kensington Gardens."

HAWFINCH, *Coccothraustes vulgaris*.—In the 'Zoological Journal' for 1826, the late Mr. Yarrell recorded the capture of a bird of this species at Notting Hill; and I believe I saw a pair in Kensington Gardens in 1837. Mr. Bartlett in 1863 recorded its occurrence in the Zoological Gardens, Regent's Park. It is a very shy bird. I kept one in confinement for a long time. It became very tame and familiar, and was wont to roost at the head of my bed, and, as soon as daylight appeared, would perch on my head to awake me and receive its morning meal. Like most favourites it eventually fell a prey to a cat. I watched for many days a pair of these birds, with a view to discover their nest. They would come every two or three minutes to a cherry tree, take a cherry, and fly away, apparently out of sight. This was done to deceive, as the nest was situated in the fork of an apple tree in the same orchard. They brought off four young ones.

GREENFINCH, *Coccothraustes chloris*.—Observed in Battersea Park, Kensington Gardens, and the Regent's Park, and may be regarded as a resident.

GOLDFINCH, *Carduelis elegans*.—A casual visitor. Noticed in the Botanical Gardens and Zoological Gardens, as well as in Gray's Inn Gardens.

SISKIN, *Carduelis spinus*.—Like the last named, a casual visitor. Mr. Henry Smith has recorded its occurrence in 1876 in the Botanical Gardens, Regent's Park.

LESSER REDPOLL, *Linota linaris*.—Has been observed in the Regent's Park.

LINNET, *Linota cannabina*.—Seen in Gray's Inn Gardens.

BULLFINCH, *Pyrrhula vulgaris*.—A casual visitor to London gardens. It has been observed by Mr. Smith in the Botanical Gardens, and by Mr. Bartlett in the Zoological Gardens, Regent's Park. It has also been occasionally seen in Battersea Park.

STARLING, *Sturnus vulgaris*.—Next to the Rook and Sparrow this bird is more generally distributed over our smoky city than any other. It is really a beautiful bird if one can only get near enough to see the exquisite metallic green and purple colour of its feathers, as it runs along in the sunshine, the busiest of the busy, searching for worms and insects in the grass. There are perhaps ten pairs in Kensington Gardens, and about the same number in Hyde Park. They build in holes in the old elm trees,—now unfortunately being levelled by the ruthless hand of Time,—

as well as in many a cranny and deserted chimney in the heart of the metropolis. A hole under a window in Gray's Inn Square has been tenanted by Starlings for the last forty years; and I can say the same, from my own observation, on the side of a parapet in Stratford Place, Oxford Street. Nothing can be more delightful than to hear a cock Starling whistling his low melodious song on an early spring morning, though he can be hoarse and harsh enough if his nest be disturbed. Do Starlings have two broods a-year? From my observations of our London Starlings, I think many of them do. I have seen them all busy nesting early in spring, and then again late in May and June—apparently the same birds—hard at it again. I can scarcely suppose other starlings come and take their place, as I know the haunts and nesting-places of almost every pair.*

RAVEN, *Corvus corax*.—A casual visitor. Mr. Jesse, in his 'Gleanings,' gives an interesting story of a Raven which was taken from a nest on the top of an elm tree in Hyde Park, about the time the bridge was built which spans the water between Kensington Gardens and the park. Early one morning in May, 1850, one of the park keepers observed two Ravens fighting in the Regent's Park; one was killed in the fight and picked up by the keeper. Mr. Bond also has a Raven in his collection which was killed in the Regent's Park. Amongst the poets generally this bird has a bad character:—

"The greedy Raven that for death doth call,
Spoiling poor lambs."—DRAYTON.

"The sad presaging Raven, that tolls
The sick man's passport in her hollow beak."—MARLOWE.

"It comes o'er my memory,
As doth the Raven o'er the infectious house,
Boding to all."—SHAKESPEARE.

"The Danish Raven, lur'd by annual prey,
Hung o'er the land incessant."—THOMSON.

In allusion to the famous Danish standard, called the "Reafen," or Raven. The Danes imagined that before a battle the Raven wrought on the standard clapped its wings or hung its head in token of victory or defeat.

* See 'Zoologist,' 1876, p. 5164, and 1879, p. 218.—ED.

CARRION CROW, *Corvus corone*.—This bird is occasionally seen passing over our parks. A few years ago a pair or two frequented Hyde Park and also the Regent's Park. Spenser, in the 'Shepherd's Calendar,' relates how nets were formerly set for Carrion Crows:—

“ For once I heard my father say
How he him caught upon a day,
Whereof he will be wroken,
Entangled in a fowling net,
Which he for Carrion Crows had set
That in our pear tree haunted.”

HOODED CROW, *Corvus cornix*.—A casual visitor. Mr. Harting, in his '*Feræ Naturæ* of the London Parks,' states that he "has frequently seen the Hooded Crow, in winter, in the Regent's Park, generally engaged in robbing the ducks of their food." He adds, "On the 8th and 9th November, 1874, a Hooded Crow was seen feeding on the lawn of the Inner Temple Gardens. It flew from tree to tree, occasionally dropping on the grass, and was apparently not at all scared by the crowds of people assembled on the Thames Embankment to see the Lord Mayor on his return from Westminster."

ROOK, *Corvus frugilegus*.—Another of our familiar resident birds. In 'The Zoologist' for 1878 (pp. 193—199), I gave some account of "The Rooks and Rookeries of London." I am happy to say that the rookery in Kensington Gardens has greatly increased this year, and if the Superintendent of the Gardens will only spare the trees I hope to see a still further increase. An appeal to the highest authority perhaps might avail. If the Chief Commissioner were only aware of the great delight these birds give to us London naturalists, he would, I feel certain, give orders to leave these interesting birds and their nests unmolested. Mr. Harting has given an interesting account of the mode in which the rookery in the Temple Gardens was formed during the reign of Queen Anne (see 'Zoologist,' 1878, p. 196, note). A large rookery near St. Albans was formed in the same manner a few years since. Four eggs of a Rook were put into a Magpie's nest in these trees and duly hatched. From that small beginning the present fine rookery owes its existence. The following story, illustrative of Rooks following their young, was

told me by an eminent surgeon now practising in London. When he was house surgeon to St. George's Hospital he was in the daily habit of taking an early walk through Kensington Gardens and Hyde Park. One morning whilst walking in Kensington Gardens he noticed a number of Rooks congregated on the ground, making a great cawing and noise. On going up to see what was the matter, he noticed two unfledged young ones on the ground, which had evidently fallen from the nest above. He took them up, put one in each pocket, continued his walk home by the Serpentine, and deposited them in the garden of the Hospital, in which at that time was a large plane tree. He was engaged in making a little nest on the ground, in which he intended to feed them, when he heard a great bustle in the tree above, and on looking up, to his astonishment, he found the plane tree covered with Rooks. They set up a great clamour, and on his going away to a distance, they all came down to look at the young birds, and then all but two went away. These two birds constantly came and fed the young Rooks, and their captor had no further trouble. He only removed them every night for fear of cats, and on bringing them out in the morning there were the old birds ready to feed them. The young ones grew up, and to prevent their flying away he had their wings cut. They remained in the garden for two years and then were allowed to fly. After a time they ceased to frequent the garden, which they did for some time after they obtained their liberty.

JACKDAW, *Corvus monedula*.—There are perhaps six or seven pairs frequenting Kensington Gardens and Hyde Park, where they are resident and breed. These birds may also be found nesting in various other localities in this great city. A pair frequent the steeple of Grosvenor Chapel, South Audley Street. Another pair have had their nest for years under the wings of a figure of an angel on the centre house of Stratford Place. The Jackdaw's partiality for towers and steeples is alluded to by Cowper in the well-known lines beginning—

“ There is a bird who by his coat,
And by the hoarseness of his note,
Might be supposed a Crow,
A great frequenter of the church,
Where, Bishop-like, he finds a perch,
And dormitory, too.”

MAGPIE, *Pica caudata*.—Yarrell, in his 'British Birds,' says, "In my note-book I have a memorandum that I once counted twenty-three Magpies together in Kensington Gardens." In 1856 a pair of Magpies frequented and built their nest in Kensington Gardens. Formerly this bird was common enough in the trees of our parks, and Mr. Harting (*l. c.*) has given an amusing anecdote of the Magpies' nests in St. James's Park in the time of Charles I.

GREAT SPOTTED WOODPECKER, *Picus major*.—A few years ago this was comparatively a common bird in Kensington Gardens. Yarrell says, "The Woodpeckers are frequently seen here; and the keeper at the Bayswater Gate reared up a family of the young of this species."

LESSER SPOTTED WOODPECKER, *Picus minor*.—Like the last-named, much commoner a few years ago. I have seen this bird frequently in Kensington Gardens up to 1866. It is very rarely observed now, but one was seen as late as May, 1878.

WRYNECK, *Yunx torquilla*.—A casual visitor. Up to 1850 this bird might be seen and heard in Kensington Gardens. Its peculiar plaintive cry, hardly to be called a song, once heard cannot be mistaken.

COMMON CREEPER, *Certhia familiaris*.—A casual visitor. If carefully looked after, a year seldom passes without this bird being seen in Kensington Gardens. Mr. Bartlett has recorded its occurrence in the Regent's Park.

WREN, *Troglodytes vulgaris*.—The loud note of the Wren may often be heard in the London parks and gardens, especially in Kensington Gardens and the Regent's Park, in both of which localities it breeds every year. I have heard it also in the gardens of Portman Square. "The Wren with little quill" has been always considered a kind of sacred bird:—

"The Robin Redbreast and the Wren
Are God Almighty's cock and hen."

And I can well remember, as a boy, with what horror we regarded the idea of killing either of these birds. Drayton has—

"And near at hand I happily espy'd
The Hedgesparrow and her compeer the Wren,
Which simple people call Our Lady's hen."

"Simple people," too, still believe that the Robin and the Wren are male and female of one species.

NUTHATCH, *Sitta europæa*.—An occasional visitor. Formerly common in Kensington Gardens, now rarely met with. I noticed a pair there in 1875.

CUCKOO, *Cuculus canorus*.—A summer visitor. Twenty years ago the Cuckoo's note might be heard in Hyde Park and Kensington Gardens; now this bird is a rare visitor. I noticed it in Hyde Park last year, and Mr. Henry Smith has recorded the fact that a Cuckoo's egg was deposited in the nest of the Reed Warbler in the Botanical Gardens, Regent's Park, where a young Cuckoo was seen sitting in a growth of Heracleums, and being fed with caterpillars by a Reed Warbler. Mr. Harting on different occasions has seen the Cuckoo in Lincoln's Inn Fields and Gray's Inn Square.

KINGFISHER, *Alcedo ispida*.—In August, 1863, a Kingfisher was seen frequently at the ornamental water in the Regent's Park, and Mr. Henry Smith has recorded its occurrence in the Botanical Gardens.

SWALLOW, *Hirundo rustica*.—"The swift-winged Swallow, feeding as it flies," used formerly to breed in the metropolis; now it only passes a few hours during its migration skimming over the Serpentine and other London waters. It is generally noticed about the middle of April. In 1863, as recorded by Mr. Bartlett, some Swallows nested in the Zoological Gardens.

MARTIN, *Hirundo urbica*.—A pair of Martins have built their nest this year in Kensington Gardens Terrace; another pair at the Magazine, Hyde Park.

SAND MARTIN, *Hirundo riparia*.—Every year in April these birds may be seen in considerable numbers skimming over the Serpentine. Record from my notes:—"April 28. Hundreds of Sand Martins flying over the Serpentine. April 30. Not a Sand Martin to be seen."

SWIFT, *Cypselus apus*.—Generally seen on migration in spring and autumn, passing overhead. In July, 1873, an immense flock of Swifts, estimated at two thousand, were observed passing over Hyde Park.

NIGHTJAR, *Caprimulgus europæus*.—Like the last named, has occasionally been observed at the periods of migration.

RING DOVE, *Columba palumbus*.—Until the greater portion of the Scotch firs in Kensington Gardens were cut down, there were generally three or four pairs of these birds breeding there, and up

to 1878 a pair nested for the three previous years in an old pollard poplar in the Green Park. In April, 1877, they were very busy there, and the pleasant "coo, coo" of the bird sounded strange amongst the din and turmoil of Piccadilly. The constant work which was being carried on under these trees in the spring, in digging and planting, caused the bird to forsake that particular haunt.

WOODCOCK, *Scolopax rusticola*.—Is occasionally found in winter in the London parks. In January last a Woodcock was seen flying at dusk down the centre of the Serpentine towards Kensington Gardens amongst the skaters and sliders, not above twenty yards over their heads.

COMMON SNIPE, *Scolopax gallinago*.—Many parts of London now covered with houses were fifty years ago the haunts of the Snipe and the Wild Duck, and there are those still living who have shot Snipe and Duck in the five fields now named Belgrave Square. Indeed, until the last twenty years, a duck-gun was a common weapon in the houses about Battersea and Chelsea. Some years since a Snipe was picked up, alive but quite exhausted, in the Strand.

BROWN SNIPE, *Macrorhamphus griseus*.—Mr. Harting, in his 'Birds of Middlesex,' states that one of these birds, now in the collection of Mr. Bond, was shot some years ago on the banks of the Thames, near Battersea, and a second, in his own collection, was obtained on the Brent, near Stone Bridge, a very short distance from London, in October, 1862.

MOORHEN, *Gallinula chloropus*.—May be observed at any time in the ornamental water of the Regent's Park and St. James's Park. It has been noticed also in Kensington Gardens and in Battersea Park.

COOT, *Fulica atra*.—Has occasionally been seen in winter in the Regent's Park and more rarely in Kensington Gardens.

GREY PHALAROPE, *Phalaropus fulicarius*.—Is occasionally found on the Thames during the autumn migration. In November, 1862, a specimen of this bird in winter plumage, as recorded by Mr. Harting, was killed on the Thames at Blackwall.

WILD DUCK, *Anas boschas*.—All our ornamental waters now teem with tame wildfowl, and during the winter many wild birds are attracted by seeing their species on the water, acting as decoys, but though they may alight for a time in passing over,

they are soon away again. Mr. Henry Hussey, writing in 'The Zoologist' for 1860-4, states that he has noticed eight different species on the London waters, *viz.*, the Gadwall, Widgeon, Teal, Pochard, Shoveler, Ferruginous Duck, Tufted Duck and Golden-eye. As these had all perfect wings, it is probable that most of them were really wild birds.

LITTLE GREBE, *Podiceps minor*.—A casual visitor to the London waters. In February, 1863, Mr. Hussey observed a Little Grebe, in winter plumage, on the Serpentine. I noticed this bird there the same year, and in 1871 I saw one in the ornamental water in Kensington Gardens. Mr. Harting, in his '*Feræ Naturæ* of the London Parks,' says, "We have observed a Little Grebe on the round pond in Kensington Gardens; and were not a little surprised one summer to find the bird nesting there, the nest, a floating shallow structure, being moored to some aquatic plants at a distance from the shore."

COMMON TERN, *Sterna hirundo*.—A casual visitor. During the periods of migration this bird is frequently seen at the Serpentine and on the Thames.

Many Gulls also, more particularly the KITTIWAKE, *Larus tridactylus*, and the COMMON GULL, *Larus canus*, pay a flying visit to our London waters.

THE EFFECT OF SEVERE FROST ON ANIMAL LIFE, AS OBSERVED IN THE COUNTY MAYO.

BY ROBERT WARREN.

THE past winter of 1878-79 will be long remembered for its severity, and for the lengthened period during which the ground was covered by snow; for, although more intense cold was experienced during the frost of January, 1867 (the thermometer indicating twenty-three degrees of frost on the 16th of that month, while sixteen degrees of frost was the lowest registered here during the past winter), yet the cold of 1878-79 was more severely felt by both birds and beasts, in consequence of the low state of the temperature having continued with little intermission from the last week of October until March.

A remarkable fact connected with the coldest part of the season in December and January was the frequent alternation of

partial thaws, severe frosts, and snowstorms, the thaws not lasting longer than a few hours, nor long enough to clear the ground of snow. In order to give some idea of the frequent changes of weather alluded to, and of the effects of the long-continued cold on the birds in this neighbourhood, I venture to give a few extracts from my note-book, which I think may prove of interest to naturalists and sportsmen.

The weather throughout October was unusually stormy, and exceedingly cold towards the end of the month, there being only one day calm enough for punt-shooting between the 2nd and 24th. On the 26th a northerly wind set in, accompanied by hail-showers, and this gale continued with occasional lulls until the 11th November, when it came on with renewed violence, bringing with it cutting showers of snow and hail and a heavy fall of snow. This, however, melted next day, but the gale held on with sleet and hail until the 14th, which was a calm bright day. During the stormy weather in October and early in November many flocks of Wild Geese were seen flying about with loud cries, apparently unacquainted with the country, and not knowing where to alight. There must have been an unusually large migration of Geese, for I never before remarked so many detached flocks passing, nor do I ever remember to have seen them wandering about for such a length of time without settling down.

The fine bright weather lasted from the 14th of November until the 25th, upon which night a hard frost set in, with snow on the two following days; the 27th was so calm and bright that I was tempted to launch my punt, and paddled down the river to Bartragh, where I fell in with some very large flocks of Widgeon, eight or nine Sheldrakes, and some Great Northern and Red-throated Divers, the latter birds more numerous than they have been for some years past. The Widgeon were very wild, not allowing me to come within shot of the main flock; but, after a good deal of manœuvring, I got a shot at a small bunch of them, knocking down fourteen birds, two cripples escaping.

On the 29th the nightly frosts ceased, and from that date until the 8th of December, the weather was mild, but on that day a sharp north wind set in with hail and hard frosts, whitening the ground, and the frost continued with such severity that on the morning of the 11th the tidal parts of the river were covered

with immense sheets of ice floating down with the ebb-tide, and so thick was the ice that I was unable to get out in my punt until low water, by which time the greater part of the ice had floated out to the bay. On getting near Bartragh I found that great numbers of Wild Ducks had come down from the bogs and lakes, their inland feeding-grounds being frozen out, but owing to the lowness of the tide I was unable to get at the Ducks resting on the sands, and meeting with few stragglers within shot of the punt, I only secured four and a half couples. The Widgeon were in large numbers, as if all the inland feeding birds had come down to the estuary, but notwithstanding the severity of the frost they were wilder than ever, and quite unapproachable. I also remarked a great many Godwits and Knots, the former appearing in larger numbers than usual.

The morning of December 12th was ushered in by a thaw, accompanied by hail, which afterwards turned to snow, thickly covering the ground; the frost setting in again at 3 p.m., and with such severity that at 11 o'clock that night the thermometer indicated twelve degrees of frost. Next day the hard frost still continued with a thick fog freezing on everything, and covering the branches of the trees and hedges with beautiful crystals. The birds now began to feel the effects of cold and hunger, and by the 14th they suffered severely, the ground being quite covered with hard-frozen snow, obliging them to take to the shore in search of food amongst the seaweed and shingle. When the tide was out I observed Fieldfares, Redwings, Thrushes, Starlings, Larks, and a few Blackbirds and Chaffinches, out on the sands, all looking very miserable with their feathers ruffled up. One Starling and a Fieldfare I picked up dead. That evening the Starlings were so affected by the cold that numbers tried to get in at the windows, and others crept for shelter and warmth into holes under the eaves of the farm-buildings and cattle-sheds. Some even came down the chimneys, and on the morning of December 15th we found seven Starlings behind the grate of one of the sitting-rooms, four of which were dead. The Rooks, for want of their natural food, became carnivorous in their habits, like Ravens and Hooded Crows, and killed and ate the weakly and dying birds wherever they could find them. We commenced feeding the birds twice a day, but it was very difficult to manage this, for the Rooks being the stronger

ate up everything. So whenever the small birds were fed the Rooks had to be watched and driven off. We found it impossible to feed the few Pheasants we have, for the Rooks ate up every grain before the shy Pheasants came to the sheaves of oats which were put out for them. Fortunately, however, the latter discovered a plot of Brussels sprouts in the garden which the Rooks did not care for, and which kept them alive. The only plan of feeding the small birds which succeeded was to put out a quantity of potatoes on the lawn for the Rooks, and while the latter were engaged, to put out some more potatoes, soaked bread, and oats near the door for the Blackbirds, Thrushes, and Finches, which were then able to feed undisturbed.

On the morning of December 17th the tidal part of the river between Moyfort and Belleek was quite frozen over, except a few lanes of open water leading to the Quay (the thermometer the previous night indicating sixteen degrees of frost), but about two o'clock a thaw set in, the sky became clouded, and a little rain fell at 10 o'clock, the temperature rising rapidly to one degree above freezing. On the 19th the thaw continued, but did not clear away the snow, while the wind set in from the north in wild squalls, accompanied with hail, which turned to snow again that evening, covering the ground to a depth of three inches. Frost again set in with a dense fog on the evening of the 20th, by which date the snow had increased in depth to twelve inches, so that the birds could find nothing to eat except what they could pick up on the shore at low tide. It was pitiful to notice how the numbers of the Thrushes, Blackbirds, Robins, and other small birds which came to be fed, dwindled away day by day, as they gradually died off, while the number of dead birds (or rather what remained of them after having been picked by the Rooks), which might be seen lying about the fields and hedgerows, was astonishing. Amongst these, Starlings were the most numerous, then Fieldfares, then Thrushes, and then Blackbirds. By this date the great majority of Starlings, all the Redwings, and the greater number of the Fieldfares had disappeared. Probably they had gone farther south, leaving only the weakly birds behind. Lapwings and Golden Plovers also left the district, although the latter were to be seen in hundreds in the fields along the coast, near Easky and Finod, County Sligo.

On December 21st and 22nd there was a slight thaw, but the

frost again set in so hard on the 23rd that at two o'clock I observed ice forming on the tidal part of the river near Belleek, and the cold and want of food then began to be felt so severely by the Black-headed Gulls that numbers were captured alive by the country children along the river side, being so weak as to be unable to fly. The intense cold still continued on the 24th, with the thickest fog I ever saw freezing upon everything, all the bays and creeks along the river being completely closed by ice. With great difficulty I got out my punt, owing to the quantity of ice piled up along the shore, and after getting afloat, the fog was so thick that I was unable to get to the Widgeon, and had to keep close to the shore, looking out for any Mallards that might be feeding where the fresh-water streams run into the river. While paddling along the shore near Killanly, a Mallard swam out from the shore to look at the punt, and after coming within about ten yards, swam towards the shore again. I followed, expecting him to lead me to his companions, which were invisible in the fog. After following for about twenty yards, I could just see some Ducks in the water along the wrack, but owing to the thickness of the fog I was unable to make out their numbers or to aim correctly. Hence, when I at length fired, I made a bad shot, only killing three birds, and these were so close to the punt that they were fairly riddled and almost spoiled. After loading again I returned along the Moyview shore to where another stream runs down, and fell in with ten or twelve Mallards feeding, but owing to the weight of ice in the boat depressing her bows too much, I was unable to elevate the gun quick enough to get a shot before they made off; I got so close to them in the fog that the instant they saw the punt they were off. The frost all day was intense, every drop of water freezing on the punt as it fell, and the paddles becoming covered with ice the instant I lifted them out of the water. The Curlews now became very thin and poor, not worth shooting, and began to search for food along the hedgerows and in the plantations, deserting the shore by day. I found one of these birds dead from starvation, as well as several Black-headed and one Common Gull.

To give some idea of the state of starvation to which the Rooks were at this time reduced, I may state that on my return home I threw the dead Curlew and three Fieldfares on the lawn, and in about a quarter of an hour they were clean picked. The

cattle and sheep in the fields were in a sad state, not having had a bit of grass since the 13th December, and as the turnips were hard frozen we were obliged to feed them entirely upon hay and straw.

The thermometer at 11 p.m. indicating sixteen degrees of frost, Christmas Day dawned with a bitter east wind and showers of hail, but about midday a slight thaw set in, and the snow on the roofs began to drip. I caught a weakly Curlew which was quite unable to fly. Although the slight thaw continued all night, yet on the 26th it made no perceptible impression on the frozen snow which still covered the ground. The day being calm I went down the Channel to Bartragh in my punt, and on my way down saw a flock of twenty-two Wild Swans flying towards Enniscrone. I afterwards heard that for a couple of days they haunted a little swampy lough situated about a mile from that village. I never before remember to have seen such large numbers of Widgeon, but, with the exception of two or three large flocks resting on the sands, the greater part were scattered in small bunches feeding amongst the seaweed along the shores of the islands whereon any wrack was to be found. I also saw large numbers of Wild Ducks, and it seemed as if all the Widgeon of the district had assembled in the estuary, being driven from the lakes and swamps by the ice. Although the Widgeon were very wild, I had a very good day's sport, securing twenty-eight and a couple of Mallards. My best shot was fourteen birds, but I should have been more successful had it not been for the number of small guns along the shore which were being continually fired off. My best chance was spoiled by a Curlew alarming a fine company of Widgeon feeding along the Baunros shore; I got almost within range when the Curlew put them up, and they moved farther up the channel, where they settled down again. I commenced setting to them with the tide, passing quite close to little bunches of Teal and Widgeon, which never rose until the boat almost touched them. I did not think them worth a shot, so pushed on to the larger flock, the tail birds of which began rising before the punt; but as I ceased paddling and let her drift with the tide, those that remained (about thirty in number) allowed me to get within range, when I fired and knocked over fourteen.

The frost returned that evening, and by daylight on the 27th

everything was hard frozen again, with a cold north-east wind, and at five o'clock a fine dust-like snow began falling, which before morning had covered the ground to a depth of three inches. I went out in my punt for a short time and secured eight Widgeon and four Ducks, but lost a fine shot at Ducks through the tube missing fire.

On the 28th a thaw set in, and continued all day. By the 29th the grass began to reappear after being covered by frozen snow for exactly sixteen days, and, rain coming on, the thaw became so rapid that by the last day of the year the fields were quite cleared of snow.

The destruction of life amongst small birds, caused by cold and starvation, was very great, and the Snipe were almost exterminated by shooting, trapping, and snaring. Some idea of the numbers destroyed may be formed from the fact that over *one thousand* Snipe passed through the hands of a game-dealer in Ballina in one week, and such were the numbers of game-birds and wild-fowl thrown on the market, that I have seen the game-dealer referred to refuse to purchase Woodcocks at any price. At this time Snipe in the hands of salesmen in Manchester could not be sold even at the low price of twopence each. The country boys in this district became so expert in the use of rabbit-traps, that they took all sorts of game and wildfowl, and by setting them in the unfrozen springs and drains captured Snipe, Woodcocks, Curlews, Wild Ducks, Widgeon, Teal, and even Wild Geese. I heard of one boy taking three White-fronted Geese with traps at a spring not a mile from the town of Ballina.

The clearing of the ground from snow afforded only temporary relief to the birds, for on the 1st of January the frost returned, hardening the ground so much as to prevent their feeding, and the Rooks and Blackbirds were only too glad to feed with the fowls in the yard. No Thrushes, however, appeared, having apparently all died off, and only one Robin came to the doorstep to be fed; one that came regularly to the back window must have died, as for some days before the thaw set in it presented a very miserable appearance with its feathers all ruffled. The Sparrows all disappeared, and of the large flocks of Chaffinches, Green Linnets, and Yellowhammers which previously haunted the barn-door, not more than four or five of each species were to be seen.

On January 2nd the frost still held, and the morning of the 3rd was ushered in by a heavy fall of snow, which lay thickly on the frozen ground. On the 4th and 5th there were alternate frosts and thaws which continued until the 6th, when heavy rain with south-easterly wind set in. The gale, with heavy showers, continued for two days, when the wind became more easterly; frost returned on the 8th, and by the 11th the river was again covered with sheets of ice, drifting out with the ebb-tide. On the 12th another thaw supervened, and five Wild Swans were seen flying low up the river. This thaw, with showers of rain, lasted until the 16th, when again the frost set in, and continued till the 18th, when a thaw, with showery weather, lasted until the 22nd, upon which day the frost returned with such severity that at 11 o'clock that night the thermometer registered ten degrees of frost, and next morning all the bays and creeks were closed by ice, the ebb-tide bringing down large sheets from the higher parts of the river. The night and early morning being quite calm was most favourable for the formation of ice on the open sea, and when the Enniscrone fishermen went out at four o'clock to set their lines in the bay they found the sea covered with a sheet of ice about a quarter of an inch in thickness, and extending for a distance of two miles from the shore! The fact of ice forming on the open sea in Killala Bay was a great surprise to the fishermen, for the oldest man amongst them had never seen or heard of a similar instance. The day being very calm I was induced to get out my punt, and as soon as the channel was partly cleared of ice I paddled down to Bartragh to try my luck with the Widgeon. I saw numbers, but as usual they were scattered along the shores, and though I secured twenty-four and one Teal, yet my best shot was only ten birds. Godwits and Knots were very numerous on the sands, and I saw a small party of Sheldrakes near Scurmore.

The frost still held, and on the 24th I saw twenty-two Wild Swans flying about the river, but instead of alighting they all went off in the direction of the lough in the Castle demesne at Killala, and on the 26th four Swans were seen resting on the water close to where I keep the boat, but on being disturbed they flew up the river to Castleconnor. The frost continued to the 27th and 28th, with no appearance of a thaw. On the last-named day I went down to Bartragh, and saw numbers of

Widgeon, but lost a fine shot owing to a misfire, and after being disturbed they would not stand the boat for a second shot; however, on my return with the flood-tide I made up for my disappointment. I fell in with a large flock of Godwits and Knots resting on the sands along the edge of the channel, and by contriving to rake their line, I knocked over about sixty birds, picking up thirty-one Godwits, twenty-one Knots, and one Dunlin, several wounded birds getting away over the sands.

From January 29th to the 31st we had hard east winds, keeping the temperature just below the freezing-point, and there was snow on the 1st, 2nd, and 3rd of February, but from the 4th to the 17th the weather became milder, with occasional showers. A change, however, succeeded, and snow fell on the 18th, 19th, 20th, 21st, and 22nd. The 23rd was mild, but hard frost set in that night, and, disappearing next morning, the weather continued fine and mild to the end of the month. The weather having become milder after the 25th, a few Starlings were to be seen returning to their old roosting-places at Belleek and Raroneen, but instead of the thousands that used to assemble before the frost set in, a few dozens only were to be seen flying in the old direction. I also noticed a few Fieldfares returning to roost in the hedges, but not a single Redwing.

To sum up the effects of the past winter, I may say that in this part of the country small birds have been almost exterminated. I have only seen two pairs of the Missel Thrush—a bird previously so common that I used to see them about everywhere in the different woods and groves. I have only heard one Thrush singing, two or three Blackbirds, a pair or two of Blue Tits, and one pair each of the Great and Cole Tits. Of our large colony of Sparrows only one old cock has returned, apparently the sole survivor and representative of his race.

OCCASIONAL NOTES.

THE TEACHING OF NATURAL HISTORY.—I cannot help saying one word upon that subject which I think, on the whole, has been worse used in the schools of this country than all the other branches of knowledge. I mean that which is called Natural History. I do not speak now of the sciences, either mental or moral science, or natural and physical science.

I speak of Natural History, such as is open to you both by the study and by the observation of living objects and of dead objects in nature, such as continually come around and solicit your attention. Now, formerly classical studies were in exclusive possession of the field, almost, I am bound to say, in my own time, to the exclusion even of religious instruction. Religious instruction, when I was at Eton, if it was not absolutely reduced to zero, was very near it. Now modern languages have come as a very formidable rival to classical instruction. Mathematics likewise assert their claim, and various other claims are set up. All I wish in the matter is that there should be fair play. I do not myself believe that Natural History has had quite fair play, and I have always felt it most grievous among the many blanks of our early training that we were totally ignorant of it. I will just give you these four points in connection with Natural History. In the first place, it is a continual lesson—a lesson at once easy and profound—of the wisdom and beneficence of Providence, a continual confirmation and belief, when you find that wonderful hand of that Workman descending to the smallest objects with the same care with which He mounts to the greatest. The religious use of Natural History is one that all must delight in. The next point is this. Learning is an admirable thing, but it does not always make itself agreeable at the first introduction, at least that was my experience; I don't know whether it is yours. Much has been done, I believe, to improve these initial stages. It certainly is a marked advantage in the study of Natural History that it leads you on by the hand; it inveigles you, if I may say so, into learning what is good and what is useful. Many a one might have his mind first opened to the attractions of Natural History, which mind, if once opened, might perhaps be capable of applying itself beneficially to harder and more repulsive studies. Another point is this, Natural History is one of the best and most efficient means for the education of the senses. Some may perhaps tell us that our senses are educated well enough already, and claim quite large enough a portion of our existence. Of course that is perfectly true so far as the grosser forms of enjoyment are concerned; but so far as the senses are concerned as organs for the acquisition of knowledge, they are very indifferently educated indeed. This habit of minute, careful, and accurate observation, which is inseparable from Natural History studies, gives to the senses that habit of accurate distinction which is invaluable as an assistant in the pursuit of every branch of knowledge. Lastly, let me say that these analogies of Natural History are invaluable; they have a most gracious effect in developing the finer faculties of the mind; they establish a connection between the different portions of creation.—W. E. GLADSTONE (Speech at Mill Hill, June, 1879).

REMAINS OF THE IRISH ELK IN THE CO. WATERFORD.—The bone-cave at Shandon, near Dungarvan, in the county of Waterford, accidentally discovered some twenty years ago, was the first Irish cave which produced animal remains belonging to the Pleistocene period. In it were found remains of the Mammoth, Horse, Bear, Wolf, and Reindeer. Professor Leith Adams, in his report on the exploration of this cave (1876), surmised that it was an enormous shelter-shed where the wild denizens repaired to end their days, or for the purpose of dragging in their prey; and he suggested that it required only funds and some enterprise to discover other caverns in the neighbourhood of this one containing abundance of Pleistocene animal remains. One such has recently been discovered near Cappoquin, at a distance of about seven miles from the Shandon cave, by Mr. Ussher, of Cappagh. This new cavern is of large size, and appears to have been occupied at a very remote period by bears, portions of whose skeletons are to be met with in the lower deposits of the floor; but the chief interest in this discovery rests in the fact that remains of the great Irish Elk (*Megaceros hibernicus*) were found in it, in conjunction with the bones of other deer and of bears, and along with a polished greenstone celt (Neolithic) and several bone-rubbers.

ROE-DEER IN DORSETSHIRE.—In the last number of 'The Zoologist' (p. 262), I see my friend Mr. Mansel-Pleydell imagines that I took Ireland to be one of the native haunts of the Roe-deer. What I said (p. 170) was that "Lord Dorchester brought a buck and two does over from Ireland." As he had an estate in Ireland it is very likely he had some Roe-deer on it, which might have been brought at an earlier date from Scotland. My information about their being brought over from Ireland and America came from Mr. Longman, of Poole, whose uncle had the charge of them when they first arrived. I trust you will kindly correct, in your next number, the mistaken impression my not over-plain note appears to have given rise to.—C. W. DALE (Glanville's Wootton, Dorset).

OTTERS IN SUFFOLK.—A fine male Otter was shot at Leiston, in this county, on the 3rd of May, in one of the mills built for draining the marshes. It measured four feet in length from the muzzle to the tip of the tail, and weighed twenty-two pounds. Otters exist in small numbers in most of the Suffolk streams, but I fear that unless something is soon done to put an end to the unceasing persecution they here meet with, these very interesting animals will soon go the way of the Badger and the Marten, both of which were living in this county within the memory of man, but have now ceased to do so.—G. T. ROPE (Blaxhall, Suffolk).

ORNITHOLOGICAL NOTES FROM ALDEBURGH.—Many of the readers of 'The Zoologist' will, like myself, have pleasant recollections of Aldeburgh,

and will feel an interest in anything connected with the Ornithology of the place. I was there on a flying visit on May 13th and 14th, and as usual took a ramble over the meres to see what birds were to be found. This spring seems to have been a good one for birds. One of the gunners told me he had seen several Godwits and Grey Plovers in their breeding dress. Peewits and Redshanks were very plentiful, especially the latter, and Coots were breeding abundantly in the first mere, but many of the eggs of all three species have been taken. I saw many Lesser Terns, and one Black Tern, which was frequenting the first mere. The Common Terns, which are generally a few days later than the smaller species, had not yet arrived. There were a few Black-headed Gulls about, and I noticed one fine adult Lesser Black-backed Gull. In the further mere I watched two splendid male Shelldrakes for a long time with a telescope, and was told that the females were sitting in some of the rabbit-burrows on the heath, where they used to breed regularly, as well as at Blackheath and at Iken. But the most interesting birds which I observed were a pair of Widgeon, which I feel sure, from their actions, are breeding somewhere in the neighbourhood. When the cock bird rose he took a short flight around and settled again in the water close to the female, and both birds seemed unwilling to leave a particular spot in the meres; close to this very spot, moreover, a young Widgeon unable to fly was caught alive last year, and taken to a friend of mine.—JULIAN TUCK (S. Mary's Clergy-house, Cardiff).

CORMORANTS ON THE DORSETSHIRE COAST.—Referring to the Editor's note under this heading in the last number of 'The Zoologist' (p. 266), a word of explanation from me seems desirable. The large Cormorant, *Phalacrocorax carbo*, is the only species of the genus which frequents the estuary at Poole, and is there universally known as the "Shag." With regard to the smaller bird, *P. cristatus*, it occurs accidentally only in the harbour, and to the eastward of Swanage; and, when met with, is regarded as being merely a small specimen of the larger bird. The few specimens procured are usually in immature plumage,—an adult crested bird being considered as something quite out of the common,—and brought in by the fishermen and gunners of the locality as a "rare foreign bird." With reference to the relative numbers of the two species on the coast-line of Dorsetshire, my experience is as follows:—Starting from Poole (of course none breed in the harbour, there being no place suited to their habits), the first colony we come to is on the cliffs at the back of Ballard Head; it is a large one, and consists entirely of the larger species of Cormorant; to the westward of Swanage, between Durlstone and St. Albans, not many Cormorants breed, but here we first come across the smaller or crested bird. I should think that, here, the numbers of the two species are about equal. Beyond St. Albans, about eight miles to the westward, comes Lulworth, the

district more particularly referred to by Mr. Harting, where are three breeding-places of the birds in question: two of them close together, on the high cliffs by Arishmill Gap. One of these consists entirely of crested birds; the other and larger colony of the Common Cormorant, *Phalacrocorax carbo*, but whether exclusively, or not, I am not quite certain, for the nests here are so high up that a mistake might easily be made. I should say that the colony of *P. cristatus* consists of about twenty-five birds; it is situated on a peculiarly-formed jutting out of the chalk, with a cave beneath it; the nests are low down, and within easy gunshot of the water. I fancy the Lulworth fishermen would not be very particular as to the species they call "shags,"—they would, probably, not know the immature birds apart,—and an adult crested bird should be designated a "green shag" rather than a "black" one. To the westward of Lulworth, about two miles off, is another breeding-station, on a moderately low line of chalk cliffs enclosing a bay with a nice beach that has no approach except by means of a boat or a rope from above. At this place a great number of the larger birds have their nests, and a few—very few, I may say—of the crested species. To give a good idea of the relative numbers of the two species near Lulworth, I may mention that some four years ago, being requested by some of the eel-pickers and fishermen of the Poole estuary to do something to lessen the number of Cormorants that infested the harbour, I went to Lulworth during the breeding-season and shot some sixty of these birds; out of this number not more than eight or ten were *P. cristatus*, and of these, nearly the whole number were obtained at the colony I have mentioned as being on the cliff to the eastward of Lulworth. At the large colony to the westward, where we obtained over forty birds, only one of the small crested species was included. I have since been informed that the Cormorants partially deserted this place in consequence of the slaughter we then effected,—resorting to the higher and more inaccessible station at Arishmill. On the whole, my experience tends to show that *Phalacrocorax carbo* outnumbers *P. cristatus* in the proportion of ten to one, at least, on the Dorsetshire coast, and I may add that I have had good opportunities for observation.—T. M. PIKE (Westport, Wareham).

CORMORANTS ON THE DORSETSHIRE COAST.—The fishermen of the coast eastward of Lulworth Cove, a district I am well acquainted with, distinguish the two species of *Phalacrocorax* by designating the smaller one the "Black Shag," and the larger the "French Cormorant," or "Watch-pocket," from the white oval patch on each thigh. Both breed on the chalk cliffs which divide the Worbarrow and Mupes Bays. I have observed a peculiarity between the two species there which I have never seen noticed by naturalists, and may not therefore be general. The Cormorant builds her nest upon the exposed open ledges of the cliffs, high up and out of

common gun-shot, whereas the Shag choseth holes and clefts; and, as the young thus secluded are less likely to be seen, the nests are at a lower level. Last week I saw several old birds issue from their dark homes as we passed in a boat and shouted, while the Cormorant remained apparently unconcerned, conscious that they were out of harm's way. The two colonies are separated from each other by a distance of more than a quarter of a mile, the Shag colony being to the westward, where an almost perpendicular fault has disturbed and fissured the cliff. Under no circumstances do either species nest on Gad Cliff or St. Alban's Head, which I attribute to the fact that both these high limestone headlands, resting upon a foundation of clay, the birds' instinct teaches them not to trust to so precarious a tenure for their breeding-places. My opinion is strengthened by their breeding on the east side of St. Alban's Head, where the Kimmeridge clays sink below the sea-bed. I quite agree with the Editor that the Shag is, and always has been, the commonest of the two species on the Dorsetshire coast.—J. C. MANSEL-PLEYDELL (Whatcombe, Blandford).

OYSTERCATCHER IN PORTLAND DURING THE BREEDING SEASON—I am not aware that the Oystercatcher has ever before been observed during the breeding season so far south, in England, as the Isle of Portland. It seems therefore worth noting that I had the pleasure of watching a magnificent male bird of this species, for nearly an hour, on June 6th, on the Weymouth side of the Chesil Beach, wading about and feeding among the rocks at low water, no more than forty yards from me. It appeared quite unconcerned at my presence, and remained close by during the time—from 1 to 6 P.M.—that I was at work up and down searching for insects and spiders near the same spot. I should conclude that the female may have been sitting on her nest somewhere in the neighbourhood, though probably not very near at hand, inasmuch as the male showed no sign of alarm or anxiety at my proximity.—O. P. CAMBRIDGE (Bloxworth, Dorset).

WINTER VISITANTS AND SPRING MIGRANTS TO THE ISLE OF WIGHT.—A Greenshank was shot on the 20th December, at Spring Vale, and a Bartailed Godwit in the neighbourhood of Bembridge. Three Goldeneye Ducks were also shot the same month—all females; this tallies with what Yarrell has remarked on the migratory habits of this species: "visits this country in small flocks every winter" . . . "particularly the females," and, probably, the immature males(?) A Red-breasted Merganser and a female Eider Duck were procured at Sea View in February. Several Great-crested Grebes were seen, but none were secured. Mr. Careless, to whom I am indebted for these observations, tells me that the Chiffchaff was not seen at Sea View till the 8th of April, but I observed one on the 30th of March, in the trees skirting the Bouchurch pond—a favourite resort on their first arrival, being sheltered from all winds. Though no Willow Wrens

were seen here till the third week in April, they were observed at Sea View by the 3rd of the month. Swallows were seen in the Undercliff on the 5th of April, but no Martins till the 29th, though one was observed at Sea View on the 9th; and the Wryneck and Whitethroat on the 12th. The Nightingale was heard on the 14th of April, though there was a slight fall of snow on that day; but they were not in full song till towards the end of the month—if then! The Cuckoo was first heard on the 14th of April. The Wheatear was not observed till the 17th, though, doubtless, it must have arrived earlier. The Redstart was seen on the 30th of April, and the Whinchat and Blackcap on May-day. A small flock of Whimbrels was observed on the 9th of May: a Sandpiper on the 12th; Swifts were also seen on the 12th. On the 7th of May a Wagtail—Ray's—settled on the rigging of a pilot-boat when some ten miles off the coast. On the 2nd of May, young Rooks were observed in some lofty elms at Bonchurch; one was seen to leave the nest when about to be fed; it was well-feathered, and well-nigh full-grown. The Starling, which is also an early-breeder, has young some weeks old; they are most voracious, and are fed every few minutes, but the old birds will not enter the nest-holes if closely watched, and resent the intrusion by a hissing, angry note. Though the above and other species have well-fledged young, some of the House Sparrow's nests are still unfinished, and only two of those examined on the 19th of May had eggs. In one there were four eggs, which were being incubated; the other had but three. No bird's eggs that I know of vary more in size, colour, and diversity of marking. Though not over-nice in the choice of building materials—as I have had occasion to point out—I never (that I remember) saw them before using freshly-mown grass to form their nests. Both the Blackbird and Thrush were late in building: no nests heard of till the 3rd of April. Martins are also backward, so there is little chance of two broods being reared this year.—HENRY HADFIELD (Ventnor, Isle of Wight).

AN ERRONEOUS BREEDING-HAUNT ASSIGNED TO THE BEARDED TITMOUSE.—Permit me to point out an error in Montagu's 'Ornithological Dictionary,' edited by Newman (1866). On p. 354, in the article on the Bearded Titmouse is written: "It is found . . . amongst the great reedy tracks near Cowbit in Lancashire." The last word should be "Lincolnshire," Cowbit being near Spalding. It appears desirable that this inaccuracy should be noted, for I have seen it copied at least *twice*, viz., in Mr. A. G. More's paper in the 'Ibis' for 1865, on "The Distribution of Birds in Great Britain during the Nesting Season," and thence into Mr. Dresser's 'Birds of Europe,' part 3. Newman evidently overlooked it in his revision of the Dictionary.—F. S. MITCHELL (Clitheroe, Lancashire).

[The mistake occurs in the original edition of the Dictionary, published in 1802; Newman no doubt relied on the general well-known accuracy of Montagu.—ED.]

LATE STAY OF BRENT GEESE AT HARWICH.—So late as the 15th May Brent Geese were still to be seen here, the greater part of them having paired on the date named. I observed a Goose come off the marshes down to the sea-shore to feed; shortly after, it went back on to the marshes followed by the Gander: the Gander again returning alone. The females are easily distinguished from the males by their lighter colour. Is it probable they will stay here to breed? By their going on to the marshes it seemed they had a nest.—F. KERRY (Harwich).

[We do not think it at all likely that these birds would remain to nest in a locality where they would be so liable to be disturbed. Many wildfowl which are winter visitors here pair and separate from the main flock before quitting our shores in spring, but only under exceptionally favourable circumstances do the rarer species remain to rear their young. The breeding of the Brent Goose in the British Islands would be an unprecedented occurrence.—ED.]

GOLDEN ORIOLE IN COUNTY DONEGAL.—Several scarce birds have been obtained in the north of Ireland during the late severe winter, and the spring has brought more than one rare species. The latest rarity I hear of is a Golden Oriole, an immature bird, now in possession of the Rev. M. B. Cox, of Glenties, County Donegal, near which place it was shot on, or about, May 24th.—ALEXANDER CLARK KENNEDY (Meen Glas, Co. Donegal).

EAGLE OWL IN LINCOLNSHIRE.—A fine female specimen of the Eagle Owl was shot near Stamford, Lincolnshire, on or about the 12th April last, and was sent to me for preservation. The bird had every appearance of being a wild one. It was in good condition, and had been feeding upon a rabbit, the flesh of which was quite fresh in the crop, and pieces of down were still adhering to the claws. The feathers were in good order, but slightly worn, and rather darker than in many specimens I have seen. The Rev. Canon Tristram examined the bird soon after it was skinned, before mounting, and his valuable opinion fully corroborates me in what I have stated.—J. CULLINGFORD (University Museum, Durham).

BLACK REDSTART IN ESSEX.—A male Black Redstart was shot at Ramsey, near Harwich, on the 14th April last. Is not this bird rare in Essex?—F. KERRY (Harwich).

[It is a regular winter visitant to most of the south-western counties and the Isle of Wight, but is less common to the eastward.—ED.]

PILOT-FISH AND SHORT SUN-FISH IN MOUNT'S BAY, CORNWALL.—The Pilot-fish, *Naucrates ductor*, is sufficiently uncommon to warrant a notice of the fact that during the present summer one was taken in Mount's Bay, Cornwall, where also was captured a specimen of the Short Sun-fish, *Orthogoriscus mola*.—THOMAS CORNISH (Penzance).

SWORD-FISH ON THE CORNISH COAST.—I have to-day (June 21st) a Sword-fish, nine feet long, caught in Mount's Bay last night in a drift-net. It is nine feet long over all; the sword is three feet long from the front of the orbit of the eye to the tip of the sword. I found it infested with an intestinal worm, about three inches in length, having a very peculiar ciliated formation for about an inch on each side of its tail. Under the skin near the tail of the Pilot-fish, of which I noted the capture yesterday, Mr. Vingoe found a parasite in shape like an exaggerated comma, with what appeared to be a mouth in the inner part of the bend. It was about three-fourths of an inch in length. In the net near the Sword-fish were taken two Pilot-fish.—THOMAS CORNISH (Penzance).

BOAR-FISH AT EASTBOURNE.—To the list of Boar-fish recently captured on the British coast I have great pleasure in adding a somewhat later instance of its occurrence. A beautiful specimen of this fish was picked up on the beach at Eastbourne on the 16th May, by Master A. E. Ripley, who forwarded it to me by post for preservation. It was alive when picked up, and the colours were still brilliant when I received it. It measured five inches in length. I have not, at present, heard of its occurrence on the Norfolk coast.—T. E. GUNN (St. Giles Street, Norwich).

LARGE PIKE IN GALLOWAY.—Some Pike of large size have been caught in the South of Scotland this spring. In the River Dee, Stewartry of Kirkcudbright, a Pike of the under-mentioned measurement was taken by a set-line, on May 26th, by Mr. T. Johnstone, of Crossmichael. In length this fish was 3 feet 11 inches; in girth, 21½ inches; and 27 lbs. in weight. A stone weighing more than eight pounds, attached to the line, had been dragged by the fish to a long distance from the spot where the line was set.—ALEXANDER CLARK KENNEDY (late Capt. Coldstream Guards).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

April 17, 1879.—Lieut.-Col. GRANT, C.B., F.R.S., Vice-President, in the chair.

Dr. T. M. Curl, of Central Rangitikei, Wellington, New Zealand, and Mr. G. C. Druce, of Northampton, were elected Fellows of the Society.

The sixth contribution to the Ornithology of New Guinea, by Mr. R. Bowdler Sharpe, dealt more particularly with birds obtained by the Rev. W. G. Lawes, from Walton and Hood Bays, near Port Moresby. Few novelties were obtained.

Dr. Francis Day read a paper upon the occurrence of the Long-headed Cod-fish, *Gadus macrocephalus*, at the mouth of the Thames, one example

of which he had obtained last January. He considered it as most probably identical with the "Lord-fish" of Yarrell, and gave reasons for doubting the Lord-fish as being a deformed example of the Common Cod, as had been suggested by several authors. Irrespective of its large head, its upper jaw is elongated and its eye larger than in *Gadus morrhua*.

Dr. J. Murie read a short communication, "Zoological Memoranda of Nile Land." These were of a varied character, chiefly unpublished jottings from his note-book, made in a journey towards the Central African Lakes, some years ago. Among the subjects were memoranda as to Pigeons in the Nubian Desert; anatomy of Nilotic Fresh-water Turtle, *Fordia africana*, Gray; fish at junction of Blue and White Niles; curious movements of the Ostrich, &c.

May 1, 1879.—Lieut.-Colonel GRANT, C.B., F.R.S., Vice-President, in the chair.

Messrs. T. E. Brown (of Adelaide, Australia), Richard Rimmer and P. O'Shanassy (of Queensland), were elected Fellows of the Society.

Dr. Edouard Bornet, of Paris, eminent for his researches on the structure and reproduction of Algæ, and other works on that Order; and Prof. Herrich Gustav Reichenbach, *filis*, Director of the Botanic Gardens, Hamburg, alike distinguished for his special knowledge of, and publications on, the Orchid group, were elected by the Society as Foreign Members, to fill vacancies caused by death.

Several interesting botanical papers of a physiological cast were read, and remarkable plants exhibited and commented on.

In Zoology a communication, in abstract, "On the Structure of the Pouched Rats of the Genus *Heteromys*," was read by Dr. J. Murie. In this paper the anatomy and other peculiarities have been worked out and a comparison with other forms given, along with remarks on the subfamily *Heteromyiinae* generally. The group is poorly represented by specimens in the museums of this country, and even the skeleton hitherto has been but imperfectly known. By the kindness of Dr. A. Günther, of the British Museum, the author has been enabled, in a considerable measure, to fill up the anatomical hiatus in our knowledge of these curious American rodents.

Anniversary Meeting, May 24, 1879.—Prof. ALLMAN, F.R.S., President, in the chair.

In his annual address, the President took for his subject, "Recent Progress in our Knowledge of the Endoproctal Polyzoa." This had shown itself both in anatomy and development. The researches of Nitsch, Oscar Schmidt, Salensky, Vogt, Hatschek, and Barrois were especially referred to. The author supported the molluscan affinities of the Polyzoa as the most strongly marked, but at the same time he could not overlook the fact that recent research had been bringing out features which pointed decidedly in

the direction of the worms. Among these, one of the most significant is the presence of a pair of symmetrically placed gland-like organs, recently discovered in *Loxosoma*. These organs open on the surface of the body, and vividly suggest the well-known "segmental organs" of worms. It is in the Endoprocta, which now include the four genera, *Pedicellina*, *Umatella*, *Loxosoma*, and the curious *Ascopodaria*, discovered by Busk among the collections of the 'Challenger,' that the most decided vermal approximation can be demonstrated.

The Report on the publications was read by the Secretary.

The Treasurer's Statement of Accounts for the past year showed a balance of £220 8s. 9d, on hand, being a slight reduction, as compared with that of the previous year, but readily accounted for by the general depression of trade, which indirectly had affected the whole of the learned Societies. Thirteen Fellows had died during the year, and three had withdrawn; and three Foreign Members and one Associate likewise were among the list of deceased. The demise of such well-known workers in science as Professor Grisebach of Gottingen, W. C. Hewitson, G. Dawson Rowley, and the Marquis of Tweeddale, may be regarded as a serious loss. During the session forty-one new Fellows had been elected.

The gentlemen chosen to fill the vacancies in the Council were Mr. F. Crisp, the Rev. J. M. Crombie, W. S. Dallas, A. Grote, and R. M'Lachlan; the President and officers were re-elected.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

May 20, 1879.—Professor W. H. FLOWER, LL.D., F.R.S., President, in the chair.

Mr. Sclater called the attention of the meeting to several animals and other objects of interest observed by him during a recent visit to some of the Zoological Gardens on the Continent.

Prof. Owen read a paper in which he gave the description of a portion of the mandible of a large extinct Kangaroo, proposed to be called *Palorchestes crassus*, from the ancient fluviatile drift of Queensland.

A communication was read from Mr. M. Jacoby, containing descriptions of new species of Coleoptera of the family *Halticidæ*.

Mr. Sclater read a paper (the fourth of the series) on birds collected by the Rev. George Brown on Duke of York Island, and on the neighbouring parts of New Britain and New Ireland. The present collection contained fifty-nine specimens belonging to forty-two species, of which several were believed to be new to science.

A communication was read from Prof. Garrod, containing a series of notes on the anatomy of the Gelada Baboon, *Gelada Rueppelli*, based on the examination of a specimen that had died in the Society's Gardens

Prof. Garrod came to the conclusion that *Gelada* must be considered as a distinct generic form, more nearly allied to *Cercopithecus* than to *Cynocephalus*.

Lieut.-Col. Godwin-Austen read some notes on, and gave a description of, the female of *Ceriornis Blythi*, Jerdon.

June 3, 1879.—Professor W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary exhibited and made remarks upon two volumes of original drawings of the Birds of India, which had been deposited in the Society's Library by Brigadier-General A. C. McMaster. The volumes contained about 270 figures of the birds of India, most of which had been drawn by soldiers in General McMaster's house at Secunderabad.

Mr. Sclater exhibited and made remarks on a small collection of birds forwarded to him by Dr. A. Döring, of the University of Cordova, in the Argentine Republic.

Mr. W. Ottery gave a description of the blood-vessels of the neck and head of the Ground Hornbill.

Mr. Edward R. Alston read a paper "On the Specific Identity of the British Martens," in which he pointed out the distinguishing characters of *Martes sylvatica* and *M. foina*, and showed that the former species only is found in this country.

Messrs. Sclater and Salvin gave an account of the birds collected by the late Mr. T. K. Salmon in the State of Antioquia, United States of Columbia. Mr. Salmon's collections were stated to have been very extensive, having been the product of some five or six years' assiduous collecting, and to have contained altogether about 3500 specimens of birds, which were referable to 469 species.

Mr. G. French Angas gave an account of the land-shells collected by the late Dr. W. M. Gabb in Costa Rica. The collection was said to contain examples of forty-two species, of which ten or twelve were believed to be new to science.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 7, 1879.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the chair.

Donations to the Library were announced, and thanks voted to donors.

Prof. N. Joly, of Rue des Chalets, Toulouse, was balloted for and elected a Foreign Member.

Mr. H. J. Elwes exhibited and made remarks upon a fine collection of Lepidoptera from Asia Minor, for which he was principally indebted to Dr. Staudinger, of Dresden, who has recently worked up the results of his

own and other collectors' work in Asia Minor. Mr. Elwes remarked that nothing in the situation, climate, or vegetation of Asia Minor would lead one to expect much difference in its insect fauna from that of other parts of the Mediterranean region; but notwithstanding that large parts of the country are still quite unexplored, the material at hand is enough to show that Asia Minor probably contains a larger number of species of *Rhopalocera* than any other part of the Palæarctic region. The majority of the species in this collection are identical with, or very nearly allied to, those of Southern and Central Europe; but in addition to the European species, of which not many are absent, are a number peculiar to Asia Minor, or only found to the east of it. As regards the species, the most remarkable facts are the large number of *Lycæna* and *Satyrus*, no less than forty-three of the former and eighteen of the latter being included, so that about two-sevenths of the whole number is made up of these genera, which appear to reach their highest development in the country. The only dominant genus in Europe which is not well represented in Asia Minor is *Erebia*, of which there are only four kinds against twenty in some districts of Central Europe; other species, however, probably remain to be discovered.

Dr. Wallace exhibited a collection of Lepidoptera made by his son in the United States of Columbia.

Mr. W. L. Distant exhibited a West African specimen of the large water-bug, *Hydrocyrius Columbiae*, Spin., common also to Madagascar and the Neotropical region. Similar in general appearance to the genus *Belostoma*, *Hydrocyrius* is recognised by the possession of two fore tarsal claws. Mr. Distant thought the insect was probably a denizen of rapid currents, and by its tarsal claws thus prevented itself from being swept away.

The Secretary exhibited a specimen, in alcohol, of a trichopterous insect, showing tracheo-branchiæ, sent from Brazil by Dr. Fritz Müller, who communicated a note concerning it.

Dr. Wallace remarked, in reply to an inquiry of Mr. Sheppard's about his silk-worm experiments, that he had experimented with nearly every kind of silk-worm which had been introduced into Europe, and that he had come to the conclusion that the only one which would pay to cultivate in this country was *Bombyx Mori*. It was true that the *Ailanthus* moth and others would produce a silk; but inasmuch as manufacturers, brokers and silk-merchants had invested large sums in the produce of *B. Mori*, they were not disposed to look with an eye of favour upon any other produce, which certainly would require much alteration in machinery and in the arrangements for business now extant. Moreover, the product of *B. Mori* was a very superior article to that produced by any other worm. It was true that in India, China and elsewhere native products were prepared from cocoons of indigenous moths, as, for instance, the Tusser-silks from

Antheræa Paphia; Moonga-silk from *Antheræa Assama*; Pongees, from China and Japan, from the cocoons of the Ailanthus moth and of *B. Pernyi*; likewise a very valuable silk from the Japanese oak-feeding *B. Yama-Mai*; and he thought that the cocoons of the species feeding on the gum-trees near Adelaide, New South Wales, which were exhibited that evening to the Society, might be utilised in a similar manner. But none of these silks were adapted to the machinery now in use in Europe, and therefore it would be better to allow native industry to collect the produce and fabricate the silks in the countries where produced.

Mr. Meldola exhibited, on the part of Sir John Lubbock, specimens of three species of moths belonging to the family *Bombycidae*, with eggs, cocoons and larvæ, sent from South Australia, together with some notes on their life-histories, by Mr. George Francis, of Adelaide. These moths, the arvæ of which are stated to feed on the native gum-trees, were respectively a species supposed to belong to the genus *Gastropacha*, *Opsirhina feroens*, Wlk., and *Anapæa (Oxleyi, Newm.)*? The first-named species, which is said to be rather rare, forms a tough green silken cocoon.

Dr. Wallace, after examining the cocoon of the *Gastropacha*, stated that it looked very promising as a source of silk.

Mr. Meldola pointed out, with regard to the *Anapæa*, that this insect, according to Mr. Francis's statement, displayed the remarkable and exceptional character of sexual difference of colour and marking in the larval condition.

Mr. M'Lachlan read an extract from a letter, dated April last, received from his nephew, Mr. W. J. Wilson, Assistant Engineer, P.W.D., located on the Anapshahr Branch of the Ganges Canal, near Meerut, with reference to an enormous flight of locusts there. They appeared early in March, and covered a tract of country about fifteen miles long by two or three miles in breadth, moving gradually northwards up the Anapshahr Branch. Their eggs were hatched in large numbers before the end of the month, the ground being covered with little black larvæ about three-eighths of an inch long. They could not fly, and the only plan of destroying them was to dig trenches about one foot deep and sweep the larvæ into them. They walk and hop about six inches. When a sufficient number are in the trench the earth is filled in. The locusts did considerable damage to peas and mustard crops, but not much to grain, which was being cut.

Dr. Fritz Müller communicated a paper entitled "Notes on the Cases of some South Brazilian Trichoptera."

Mr. Wood-Mason read "Morphological Notes bearing on the Origin of Insects," and exhibited microscopical preparations in illustration.

Part I. of the 'Transactions' for 1879 was on the table.—R. MELDOLA,
Hon. Secretary.

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ON NOCTURNAL ANIMALS.*

BY JAMES MURIE, M.D., LL.D., F.L.S.

A CONSIDERATION of all that is known respecting the habits and manifold peculiarities of those animals whose active phases of life come under the denomination "nocturnal" is manifestly impracticable within the limits of the present paper. A selection of instances in point, therefore, is unavoidable. In this case preference is given to the Vertebrata, inasmuch as many are familiar objects in our public gardens and travelling menageries.

Scarcely one of the subkingdoms and classes of animals can be named but has a subordinate group, or more often a limited section, or species of a group, which, in contradistinction to its fellows, exhibits abnormal habits and manifests a preference for darkness over daylight. Very frequently there is associated with this exceptional habit some diversity in organs and subsidiary structures adapted to the creature's particular mode of life. Still occasionally where no pronounced structural differences are observable one is at a loss to account for singularity of habit. Something, therefore, which is not always apparent may underlie this tendency to variation.

Can it be that one or more dominant though hidden forces are at work that at least would partially explain the enigma? Or

* This article is based upon a lecture delivered by the writer during the present summer, in the course of "Davis Lectures" at the Zoological Society's Gardens. It has been modified, however, in some respects, and especially in the elimination of much that was stated with regard to the lower forms of life.

are animals actuated by the varied motives which influence reasoning mankind, subdued and modified, as a matter of necessity, from imperfection in their structural detail?

Carlyle has quaintly said that "the two great moving powers of society are hunger and the policeman." Sternly inexorable is the former, a humiliating necessity the latter. Now as animals must eat to live, it is not unnatural that they should be found abroad at such times as their prey is most easily procurable. Moreover, they have cautiously to avoid their own enemies, and thus find safety in feeding under cover of darkness. But besides the craving for food there seems another influence which, though at first less recognizable, is possibly much stronger in its potency—namely, an inclination to seek shade. Throughout the animal kingdom generally, but more especially among the lower forms, examples of this are numerous. Coincident with an uncomfortable feeling, howsoever produced, is retirement to shade. In short, light acts as a stimulus, not equally shared by all creatures. Its influence on protoplasmic matter is evident, and is of continual occurrence even among animals of most imperfect organization. Traced upwards from these, the reception of sensory stimuli presents us with superadded or adaptive structural modifications often rendered acute to a degree.

How gradual development from simple to more differentiated conditions has been brought about in the march of time, and what may be the relation of transmission of qualities from parent to offspring I leave unanswered as involving discussion apart from the immediate purport of this article.

Premising that nocturnal activity is the sequence of an endeavour to shun light, as annoying or detrimental to the organism, and that in certain cases search for food or other functional impulse necessitates nocturnal habits, I shall confine my remarks accordingly.

In using the term "nocturnal," I would wish it to be understood in its widest sense. Thus the great mass of animals are abroad, feed, and otherwise are actively employed, so to say, *in their business of life*, during daylight and sunshine, that is, from morn till eve. Not a few, however, from preference or necessity, are then in retirement, from which they only emerge between nightfall and sunrise. Others choose twilight or the "gloaming"—that hazy obscurity which precedes the setting in

of night; while others, again, roam at early dawn, when stillness and imperfect light prevail. The term "diurnal," in strictness, is applicable to the first mentioned; the three others may therefore be classed under the head "nocturnal," although the term "crepuscular" is not unfrequently employed to designate those animals whose habit it is to issue forth in the glimmering betwixt light and darkness.

But the limits of separation are not easily defined, notwithstanding breadth employed. Take mankind collectively, and without hesitation they would be classed as diurnal creatures; yet a moment's reflection will show that, either from choice or necessity, many individuals lead a truly nocturnal life. Nor can it be said the crepuscular element is here wanting, albeit the use of artificial light. Again, Herbivores, the Deer tribe particularly, are diurnal, yet under certain conditions—*i. e.*, during the breeding season—they temporarily become night-roamers. Other somewhat corresponding instances of change from ordinary habit may more fitly be referred to in the sequel.

An explanation of some of the peculiar phenomena observable among Nocturnal Birds and Mammalia (Bats to wit) would be incomplete without a due consideration of the senses and sensory organs of a few of the inferior orders of the Invertebrata, as elucidating fundamental principles.

Quite at the bottom of the scale which zoologists have to deal with are the group of Protozoa,—creatures all more or less of the simplest construction, and for the most part microscopic in size. Little indeed is there to be shown in the organization of such a form as *Protamæba primitiva*, Haeck, where alone a faint greyish coloured and translucent, granular, gelatinous substance is recognizable. This jelly-like material, notwithstanding, possesses all the essentials of animals far higher in the scale, inasmuch as, without any organs whatsoever, the necessary functions of organic life and reproduction are performed. Its sarcode is sensitive to impressions—*viz.* subject to irritability; hence contraction and expansion—*i. e.*, movement. It suffers waste of tissue, hunger follows, and supply means assimilation of nutriment at any point, and simple division means reproduction. But as bearing on our question at issue, of greater signification is the remarkable property of this jelly's having a diffused sense, equivalent to touch. Thus this so-called sixth sense of some

writers, modified in a variety of ways, becomes an important factor in all that relates to adaptation to "nocturnism," if such an expression is admissible.

Possibly the above and others of the Protozoa are not strictly nocturnal, though some shun direct sunlight. But whether heat-rays may have a determining influence is an open question.

Among the Medusæ, or Jelly-fish (*Cœlenterata*), which, though met with during the day-time, abound most frequently, in calm, clear weather, at the surface towards nightfall, or when complete darkness has set in, sensory organs of a most rudimentary kind are developed. Nerveless, as ordinarily understood, yet, according to the recent researches of Romanes, Eimer and others, defined lines of sensory impressions exist in the sarcodous jelly of their umbrella. In fact, reflex action is apparent, minus true nerves. A few minute calcareous particles aggregated together or within a sac scattered towards the periphery of the umbrella, acoustic vesicles, are forerunners of organs of hearing; and for eyes there are pigment spots at the base of the tentacles, the latter themselves being feelers.

Thus the Sea-blubbers are instructive as evincing diffused sensation along with localized spots wherein this touch becomes, by slight differentiation of tissue, instrumental in the production of hearing and sight, of course in an inferior degree. Although absolute proof is wanting, it is quite within the range of probability that their stomachal cavity appreciates in a faint degree approaches to a low kind of taste and even smell. In some genera more diurnal in habit, their extreme sensitiveness to light is manifest by their immediately closing and descending when heavy clouds dim the atmosphere.

The foregoing well illustrates Mr. Herbert Spencer's views ('Principles of Psychology'), viz.:—"For every higher phase shows itself as an ability to recognise smaller and smaller differences, either of kind or degree, in attributes of surrounding bodies; and so render it possible still further to specialize the adjustment of inner to outer relations."

In nocturnal animals this principle is carried to its fullest extent, all adaptations to habit being connected with endowment of extra sensitiveness specialized.

The Annelids, however, afford plentiful examples of preference for darkness; and the common earthworm is both easily observed

and procurable for examination. Except in damp weather and dull days, they are shy and not much given to be abroad; but in the evenings, all through the night and early morn, especially during moist weather, they crawl hither and thither with unrestrained freedom. Keen fishermen know when best to seek their bait, and the proverb of the "early bird finding the worm" points to grey dawn. Here then we see that the nocturnal habit of the one creature superinduces the necessity of similar habit in the other. The bird's own enemy, again,—it may be reptile or mammal,—must stir betimes; and thus, from class to class, the nocturnal and crepuscular habit is transmitted. Once acquired and perpetuated, modification of organs adapted to the altered circumstances ensues. Tactile sensation among groups of the Vermes is through minute skin modification, papillæ, bristles, or cup-shaped bodies, all in connection with the nervous system. Though the earthworm itself is blind, it is not so with others, where evolution of visual organs from indifferent condition to complex lens, crystalline rods, cones, &c., is well marked. Auditory organs are also present in some.

With regard to the Mollusca, and with them we may associate the Crustacea, some doubtless are nocturnal; others live at depths where only a modicum of light is admissible. Not a few retreat to darkness under cover of rocks, stones and sea-weed. But slugs and snails are active after sundown, and all night long commit their ravages, while their reptilian and avine pursuers have to follow suit.

Of Arachnida, Myriapods, and quite a host of the division of Insecta, one is at a loss by the *embarras de riches* of those that carry on their life occupations under cover of darkness. Suffice to recall some of the Trap-door Spiders and their ingenious devices so graphically portrayed by Mr. Moggridge; while to those who have felt the effects of the nocturnal attack of the venomous Scorpion, the name is sufficient. Deeply interesting is Mr. Moseley's researches on the caterpillar-looking nocturnal Myriapod of the Cape of Good Hope (*Peripatus capensis*). It is there quite local in habitat, and is found under dead wood, wherefrom it creeps out at dusk. A pair of horn-like antennæ project from its head, and it crawls by the aid of seventeen pairs of hooked, conical feet. It breathes air by trachea and stigmata. Cutaneous glands secrete a viscid fluid, which, Capt. Hutton

asserts, is thrown out, as if by magic, in fine thread-like jets, and by this viscous web insects are caught and afterwards devoured. Mr. Moseley believes this creature is of great antiquity, and the ancestor of spiders, Myriapods, and insects. If so, then nocturnal habits are not of recent introduction. The variety and modifications of apparatus manifest among nocturnal insects, and as adaptive to that habit, almost forbid attempt at selection of instances.

The Vertebrata have their full share of night-hunters, and equally can Fish, Amphibia, and Reptiles be cited.

When we come to Birds (Aves), we find that although the majority are diurnal, yet many are habitually crepuscular—either found on the wing as the sun goes down, or abroad for their living early in the grey dawn. These very often pass the day-time tranquilly or dozing under shade, and stir about between lights, though roosting at night. Birds with young are urged by the maternal instinct, and will then keep late and early hours, quite out of their usual way.

But in generalizing on nocturnal habit, it should not be forgotten that what applies to the northern regions does not always hold good of the tropics. As we near the equator, sundown all the year round means quick and often intense darkness, to be continued till sunrise, and consequently there is a certain seasonal uniformity in animal habit. In higher latitudes summer twilight stretches further on, and the first blush of the morning quickly succeeds. It follows that diurnal groups of birds and mammals of the tropics acquire more crepuscular habits the further north they go, particularly in the summer season; and winter weather correspondingly brings change of hours.

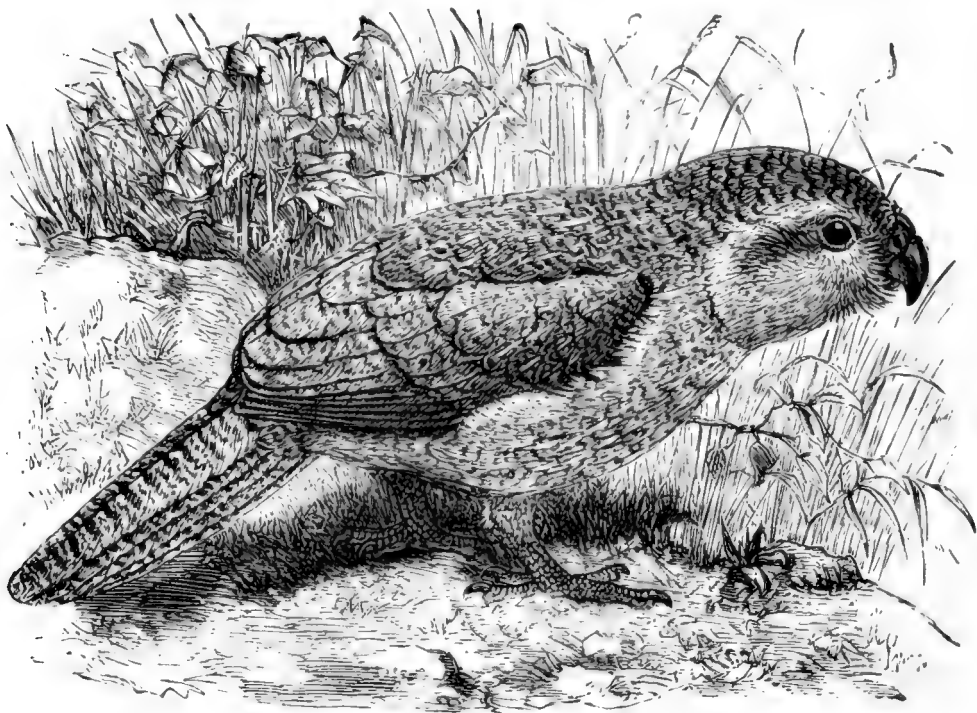
The Struthionidæ (Ostrich group) attract attention in having one New Zealand genus, the diminutive *Apteryx*, which is a night-hunter. It might be interesting to know if its island congeners, the great extinct species of *Dinornis*, were also nocturnal—a question easier asked than likely to be satisfactorily answered, though I should say they probably were. The night habits of the *Apteryx* are well attested, those confined in this country being as shy of daylight as their wild brethren in New Zealand. Selecting a dry hole in sand, tree, or log as their usual abode, or artfully concealing themselves among the dense beds of fern, the Kiwis lie, generally in pairs, torpid and drowsy while day lasts. The approach of night sees them awake and hunting

hither and thither for their food. This is not of a vegetable nature, but consists of worms, snails, lepidopterous larvæ, and such insects as they come across. At such times the very marked peculiarities of the long, narrow, terminally knobbed beak, the loose, freely movable brush of tactile rictal vibrissæ, the hair-like feathers set all over the body and short stout legs, are plainly adaptations fitted to its nocturnal search for food. As regards the eye, this has an absence of pecten or marsupium compatible with night habit, and it is relatively smaller than in the other Struthionidæ. This is amply compensated for by feathering, and especially the extremely sensitive vibrissæ. These at every motion of the bird inwardly convey impressions of touch, and guide it among the dense grass and vegetation where sight might be less available. It is said to make a sniffing noise when searching for food, possibly produced by the imperfect closure of nostrils placed, most unusually, at the bulbous extremity of the beak, as this latter is inserted among the loose soil and herbage. But at all events the careful dissections of Professor Owen show that the organs of smell and taste, as well as hearing, are unusually well-developed. In this case the point of the bill, with its nerve-endings, has a sense of most delicate touch over and above olfactory power. Without going into other detail of structural differences between the *Apteryx* and others of its order, enough has been said to show that functionally the former is modified to adapt it to nocturnal habits.

Amongst the noisy diurnal group of Parrots (*Psittaci*) are two night-roamers. One of these is a New Zealand form, and the other a native of Australia.

Of the singular New Zealand Night Parrot, or Kakapo, as the natives name it (*Stringops habroptilus*), Dr. Günther informs me that it is reported as a perfect nuisance to the shepherds. In the dark it steals among the sheep, and, mounting their backs, vigourously searches for all the ticks and vermin it can find, but in the search it not unfrequently tears the skin and flesh as well as the wool. In this respect it is a bad imitator of the African Oxpeckers, *Buphaga*. The *Stringops* is a larger bird than *Geopsittacus*, presently to be mentioned, though intensely like it in its sap-green colour, markings, and outward aspect generally. It has a dazed eye during the day, indicative of moderate light being most suitable for perfect vision. The

wings are relatively short and rounded, and although it has parrot-like feet, yet these are adapted more for ground-running than grasping. It has a somewhat strigine face, the radiating feathers around the eyes simulating the facial disk of the Owl's, while numerous tactile hairy feathers prominently occupy the root of the beak. Dr. Günther's statement, as above, denotes an insectivorous bird, or one that would not despise worms or other vermin, but other information on its habits leads to the supposition of a preference for vegetable food. Dr. Selater remarks of that living in the Gardens in 1875:—"The *Stringops* is most strictly nocturnal in its habits, and never emerges from the box in which it is kept, voluntarily, during daylight. Our specimen has no power of flight, but uses its wings to aid it in running. It feeds upon oats, apples, lettuce, carrots, and other vegetables, and appears to thrive well upon this diet."



NEW ZEALAND NIGHT PARROT.

Stringops habroptilus, Gray.

Sir George Grey records of the Kakapo that during the day it remains hid in holes under the roots of trees or rocks, rarely perching. Sleepy and stupid as it hides among the grass during the day, at sunset it becomes lively, animated, and playful, then

feeds, with a grunting noise of satisfaction, on grass, weeds, fruit, seeds, and roots. It grazes or nibbles the grass in the manner of a Rabbit or Wombat.

In Mr. D. Lyall's account of the wild bird, in his communication to the Zoological Society, he mentions that at the south-west of the middle island of New Zealand he found them living in communities on flats at the river's mouth near the sea, and more hillwards; tracks a foot wide abound where they run about. As many of the roots of trees are above ground the Kakapo burrows among them. Flight was rarely seen, and then for very short distances, the wings scarcely moving, and the bird, alighting on a lower level, only gained height among the hollow trees by climbing, the tail assisting. It is seldom or ever seen during the day, and dogs are used to hunt it. Indeed, the dogs which have run wild, with the cats, besides man, are rapidly exterminating this strange Parrot. There can be little doubt, he says, that their food consists partly of roots (their beaks are usually more or less covered with indurated mud), and partly of the leaves and tender shoots of various plants.

Another writer, Mr. G. S. Sale, who kept one alive in this country some time, says its playfulness is remarkable; it will run from a corner of the room, seize the hand with claws and beak, and tumble over and over with it exactly like a kitten, and then rush back to be invited to a fresh attack. It is also humourous, dancing with outstretched wings, evidently shamming anger. It is generally lively enough during the day, but not so noisy as at night.

The Western Ground Parakeet (*Geopsittacus occidentalis*, Gould) has considerable resemblance to *Stringops* and to *Pezoporus*, another ground-loving Australian Parakeet. *Geopsittacus*, however, lives in rocky caves and comes out at night to feed, as Mr. Ryan, of the Gawler Ranges, Spencer Gulf, assured Dr. Müller, and this is corroborated by Mr. A. D. Bartlett's observations on a bird in the Zoological Gardens. As might be expected from its habits, the wings are like those of many night-flying birds; the eyes, of moderate size, in daylight have a strange hazy expression, not easily described, but quite characteristic of nocturnal animals. The cere is unusually full and fleshy, with wide nostrils, and a pencil of elongated hair-

bristles below. The bird appears to be a vegetable-feeder, and is almost noiseless, uttering very rarely a harsh double note.

The Owls (*Strigidae*) present some strange modifications, and prominently display the fact that organs, by almost insensible gradation of structural change, are equally adapted for use by daylight, semi-darkness, and night. Only intensity of sensory power is secured where absence of light is essential to their well-being. What more applicable to noiseless flight than their fluffy feathers, whose lightness is strengthened by additional serrated delicate barbules interlocking and giving the gossamer framework efficacy for nocturnal purposes? Their great curiously-set eyes, with enormously broad iris and other anatomical attributes, so dazed in the sun's glare, light up and receive every faint ray of night reflection; their auditory apparatus, with great open tympanum, downy plumage, and circle of feathers, in substitution for an auricle, guiding and concentrating sound, however faint, to the recesses of an ear specially constructed as a receptacle for appreciation of vibratory movement. The facial disc, the peculiarities of cere and nostrils, the beak and talons, all betoken adaptive power as aerial night-hunters.

The Nightjars (*Caprimulgidae*) are equally creatures of night; but, unlike the Owls, their enormous gaping mouth, defended by stiff bristles, is an adaptation implying hunting and securing prey on the wing. Swallows of the night, the Goatsuckers possess a plumage vying with the Owls in soft delicacy and lightness. The eye equally and specially conforms to the principles necessitating vision in the uncertain haze of twilight and night. The diminutive weak legs present no characters of a percher, and the bark-like plumage of the bird, when resting and covering on boughs, protects it from its diurnal enemies. It has a peculiar pectinated claw on the middle toe, which may either facilitate its balance on a bough or be used as a cleansing tool when broken moths'-wings stick around the gape. No nocturnal beetle or sphinx moth, however powerful on the wing, is safe from the noiseless circling sweep or rapid dash of "the awaken'd Churn-owl."

Many other birds besides the foregoing are nocturnal; but these illustrate sufficiently how sensory organs are correlated with crepuscular habit.

In passing to Mammals, numerous groups are found with decided night tastes. Monotremes, Marsupials, Edentates, Rodents, Carnivora, Insectivora, &c., all furnish marked examples. Some are burrowers, others partially aquatic, others again arboreal, no animal profession being unrepresented.

The Cat tribe is familiar. Their cushioned feet give softness of tread; their hearing is exceedingly good, though their outer ears may be small. Long bristly whiskers stand out, and as tactile organs quickly convey impressions of surrounding objects. Smell, too, is acute, though not used equally by all to obtain prey. Sight, however, is most relied on. The greenish or sometimes reddish glare of the feline eye is familiar, as well as that of other nocturnal mammals. This is produced from the *tapetum*, a brilliant iridescent membrane immediately beneath the retina, whose finely ribbed surface produces the coloration as an interference phenomenon.* The ensheathed sharp claws and cat-like and muscular development of the body complete organisms all highly adapted for the capture by night of often powerful prey.

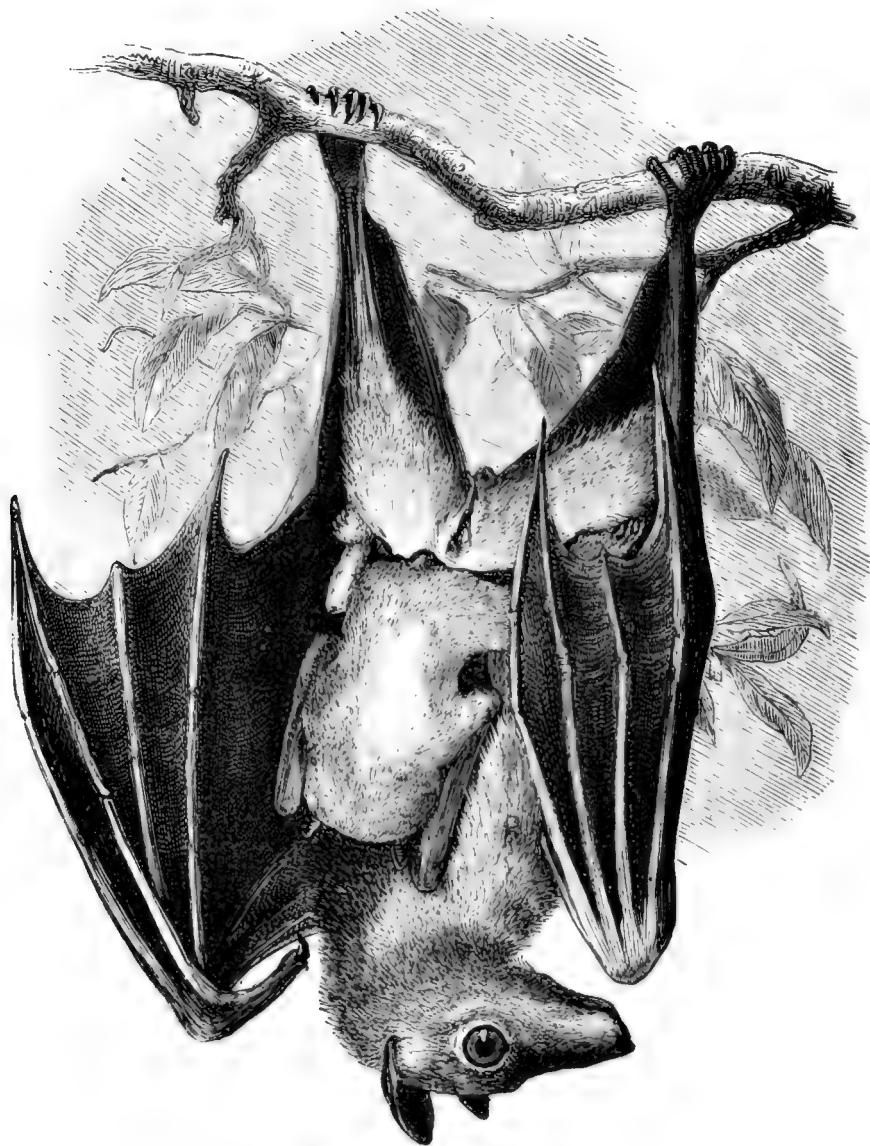
But even in the case of Ruminants which, as a rule, are diurnal, night excursions among the vast African herds occasionally happen. The Grysbok during the day lies hid in reed-beds, and regularly feeds at night.

The Elephant and the Tapir are often night-roamers, want of water being a chief incentive with the former; its great ears as tactile organs are then useful in treading in the gloom of the forest.

The Star-nosed Mole (*Condylura*) and the Urotrichus may be cited as instances where the lengthened nose, having fringed processes of a tactile kind, supplies this deficiency of sight.

Among the entire range of nocturnal animals none exhibit so strikingly, or in so high a degree, the diffused sense of touch (referred to when speaking of the very lowest animal forms) as the Bats (*Chiroptera*). So accustomed are we to associate them with the dusk that when the writer once saw, in Central Africa during the middle of the day, a flight of literally myriads of great Fruit Bats, he was as much astonished at the diurnal spectacle as

* There are two forms of *tapetum*—1st, cellular, as found in fishes and carnivora, whose cells contain lime-crystals in the former, seldom in the latter; 2nd, fibrous, as found in many other mammals.



THE COLLARED FRUIT BAT.

Cynonycteris collaris, female, showing mode of carrying young.

at the numbers. They covered the sky like a cloud, and kept steadily passing over for many minutes. Though keen-sighted, Bats generally have rather a sharp rat-like eye than an ocular apparatus indicating a large field of vision. The dark colour of the eyeball, as a rule, prevents the contraction (often to a pin's point) and expansion of the iris and pupil being readily noticeable; though there is considerable power in this respect. But if the eye of a large Bat—such as that depicted in the

woodcut—be attentively observed when exposed to the strong glare of sunlight, that hazy, lustreless expression so indicative of night habit is readily appreciated.

Hearing in these animals is a well-developed sense. Not only is the internal ear a highly efficient organ, but, as is well known in several of the Bat families, the enormous size of the thin membranous conch is out of all proportion to the dimensions of the animals themselves. Moreover, the tragus, especially in the *Nycteridæ* and *Vespertilionidæ*, is extraordinarily exaggerated. The external nasal apparatus, even in our English Horse-shoe Bat (*Rhinolophus*), is an extremely absurd-looking nose-leaf; but in the Vampires (*Phyllostomidæ*) and Megaderms the same part, in size, complexity, and ugliness, almost exceeds the ridiculous. Smell, in fact, like hearing, has a superadded intensity, through the exterior apparatus and its wonderful tactile power. Taste, in the Fruit Bats, at least, is in no way deficient, though probably little influencing nocturnal peculiarities. Concerning touch, it is the strangest physiological problem in the whole history of their economy. The wing membrane of a Bat, most persons are aware, is a thin tegumentary extension stretched between the enormously lengthened but attenuated bones of the hand (see figure)—that is, both palm and fingers. At one bend, that which represents the wrist-joint, is a short-clawed grappling-hook, the thumb. The lower and upper arm bones are each greatly elongated, especially the former. This long-levered arm, which otherwise would be weak and futilely beat the air when outspread, is further strengthened and improved as an organ of flight by a delicate though tough web running out like a guy-rope in front. Furthermore, a continuation of broad web reaches from the inner finger and arm to the body, and onwards to the heel. The form of the tail varies in different genera, and is capable of being extended according to the length of the membrane by which it is attached to the sides of the leg. Throughout all this extent of membrane highly elastic tissue and minute muscular fibres are so distributed that the web can be partially or wholly furled as circumstances require.

The young cling to the mother by clutching her most tenaciously, and she flies about or roosts head downwards, enveloping her offspring with the wing-membranes. But the wing- and leg-webs, the great membranous ears, and, indeed,

all the sinuosities of facial and nasal flaps, &c., subserve a sensory purpose necessary to the well-being of these nocturnal creatures *par excellence*. Though often transparent, flesh-like, and seemingly bare, yet everywhere, and scattered on both sides, are extremely slender, delicate hairs, the bulbs of which widen out and enclose minute tactile organs (*Tastkörperchen* of Dr. Schöbl). Added to these, fine nerve-threads are freely distributed; and, as if further to enhance the extreme sensibility of the part, a perfect network of contractile capillary blood-vessels.

Hence, as in the *Amœba* and Jelly-fish, every particle of the surface is a tactile apparatus with a sensitiveness possibly unrivalled in the animal kingdom.

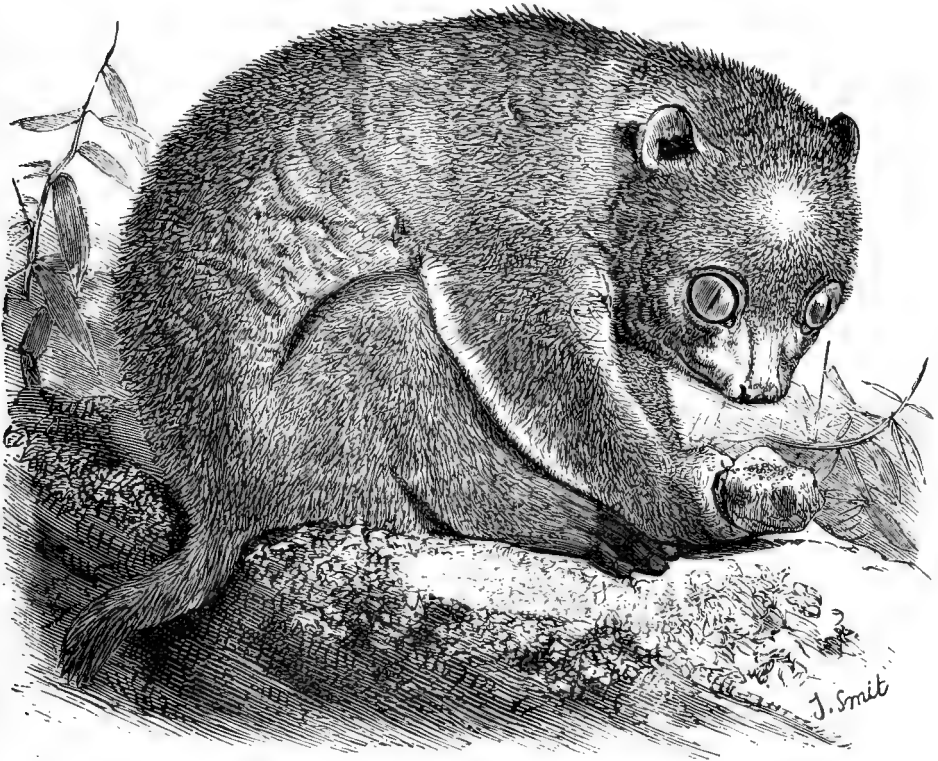
For a long time it was inexplicable how Bats flew in the dark with unerring certainty. The remarkable experiments of the earnest and shrewd Abbé Spallanzani showed that, after eyes, ears, and nose were destroyed or obliterated, so far as sensation or use was concerned, the mutilated creatures avoided every minute obstacle placed in the way; they even threaded dark caverns, and found out nooks and crevices in a most extraordinary manner. That the result of these experiments was not mere accident or good luck on the part of the Bats has been shown by Jurine and Schöbl, who repeated them. Moreover, the careful microscopic researches of the latter have revealed, as above stated, structural conditions not previously suspected.

One can no longer wonder, then, how important and efficacious to crepuscular and night-roaming animals are long vibrissæ, erectile spines, filaments, and such-like organs, as well as the tactile delicacy of palm, pads, &c.; in fact, impressions are by these means conveyed, which to diurnal animals are unknown and unrequired.

Though not absolutely rivalling the Bats in constancy of nocturnal habit, or endowed with the sense of touch in its broadest aspect, still the *Lemuroidea*, or Half-Apes, as some naturalists designate them, are marvellously interesting, from their adaptive structure to nocturnal habit. Some are cat- or fox-like in build or expression, others puggish; all are quadrumanous, with big opposable thumbs and gréat toes; a few possess abnormally developed fingers; none are so intelligent and mischievous as

monkeys. Those of the genus *Lemur* are much more diurnal in habit than their congeners, or rather, they are out morn and eve, and often sleep of a night. But the majority of Lemuroids are, truly speaking, nocturnal animals.

The "night-eye" is dominant, with its vertical and changeable pupil, passing from faint streak to wide circle. Most of the species have thick tactile whiskers. The abnormal bulbous tips of the toes are quite peculiar looking, but their utility is explained by the fact that each pad is an exquisitely sensitive apparatus, possessed of a marvellous power of touch. These creatures see, as it were, through their fingers, like the blind man. There is much difference with regard to ears; in the *Loris* group they are of moderate size; the *Tarsius*, the Aye-Aye and *Galagos*, on the contrary, have great bat-like ears, the latter singularly movable. All are most sensitive to changes in temperature, and soft furry coats are noiseless protectives in their night rambles.



VAN BOSMAN'S POTTO.

Perodicticus potto, Gmelin.

As each group of the Lemuroids is constructed, *sui generis*, for night exploration, a brief glance at one or two of the most

singular is all that can here be taken. The Potto or Bush-dog (*Perodicticus*) is one of the stumpy West African slow-moving species. A short tail and well-nigh obsolete fore finger are its chief exterior characteristics. Its habits are so similar to the better known Asiatic Slow Loris (*Nycticebus*) that reference to the latter will serve both. Seen in the daytime, or made to walk on a flat surface, from its weird-looking eyes, sack-like body, long limbs, and slow straggling gait, one would predicate it the worst of night-hunters; but give it a grasping surface and place a beetle before it at night, and the eye lights up like a globe of fire: the quiet demeanour and sudden rush on the prey is astonishing. The perfect silence in movement, tenacity of grasp in climbing, tactile appreciation and dilatable eye, all enable the creature stealthily to approach birds, insects, and creeping things, and to snatch at and secure them in a twinkling. The great-eared Javan *Tarsius* and the African Galagos, on the other hand, are perfect imps of nimbleness. Their furling ear-conch catches every sound, their sensitive palms and facial vibrissæ warn them of every obstacle in their path, and the unusually lengthened heel-bones, like frogs, enable them to spring astonishing distances, so that they are on their prey like lightning.

The great-eared Aye-Aye of Madagascar, so lucidly described by Professor Owen, is even more curiously adapted for its peculiar nocturnal rambles. It seems almost blinded by daylight, but brilliantly orbed in darkness. The two middle fore-fingers are bat-like in tenuity and length, and probe nook, crevice and corner with super-sensitive tact and skill. Its whiskers and skin warn by delicacy of touch, and its strange rodent-like teeth serve as effective chisels in night hunts for creatures, the presence of which ear and finger alone indicate.

The Lemuroids, as a whole, then, embody perfection in varied apparatus useful nocturnally. As with the Bats, Mr. Herbert Spencer's principle is highly applicable, *viz.*, "There can be no doubt that the sensation of touch and pressure are consequent on accelerated changes of matter produced by mechanical disturbance of the mingled fluids and solids composing the part affected."

The Douroucouli (*Nyctipithecus*), a small animal allied to the Capuchin and Squirrel Monkeys of South America, decidedly leads a nocturnal life. Several species have from time to time

been kept at the Regent's Park Gardens. Visitors seldom see a specimen; for, like the Slow Loris (*Nycticebus*), it cuddles up during the day time and seeks shelter in its box. When poked it seems bewildered by the light, and the eyes present the dazed appearance common to the Nocturnal Lemuroids. Like the latter day-sleepers, it brisks up at sunset, and then is active, when all other of the monkey tribe slumber. In general anatomical structure it resembles the *Cebidæ*; but the molar teeth are tuberculate; the iris has great power of expansion and contraction, the great round pupil at night giving quite a different expression to its contracted diurnal aspect; and lastly, the palms of the fore feet exhibit more tactile properties than is common to the generality of the monkeys. Functionally, therefore, eye and finger-tips, or sight and touch, have become extremely sensitive to impressions, by a change in the minute tissues of a very limited kind; but they are just sufficient, along with the slight dental cusps, to effect a radical change adapted to night habit and insectivorous food. In the dark virgin forests, the Doroucoulis after nightfall nimbly lay hold of small birds and chase the spiders, beetles, cockroaches, and other nocturnal insects—even bats they are said to devour—though they by no means despise sugar-cane, fruit and nuts. In the Zoological Gardens it is difficult to rouse the creature during the day; but Mr. Bates says that in the Amazons they are aroused by the least noise, so that when a person passes by a tree on which a number of them are concealed he is startled by the sudden apparition of a group of little striped faces crowding a hole in the trunk.

Thus true Apes and Monkeys (*Quadrumana*), with the single exception of the South American genus above mentioned, are in the full swing of their ceaseless activities and eccentric pranks in broad daylight. Just before sunset, when in the forest, one occasionally hears a chattering noisy lot either settling friendly differences or having a final "scrimmage" ere repose, but no sooner has gloom spread than all is hushed. Even in our Zoological Gardens, where the creatures feel secure from night attack, their silence then is in marked contrast to their companions, the Lemurs. Some monkeys when in their native haunt are astir at grey dawn, and in bands make for the nearest plantations, commit ravages, and scamper off before the sun has got well up in the horizon. Man has then his part to play; and

so by interdependence of habit, from lowest to highest of the animal kingdom, the round of night labours and watchfulness goes on.

In a mere sketch like the present, the subject obviously receives but scant justice; for many interesting nocturnal animals, peculiar habits, and curious structural conditions suggest themselves, of which no mention has been made. Nevertheless one may be justified in a retrospective summary of the points influencing, doubtless to some extent, nocturnal habits.

All animals suffer waste, and necessarily require food and drink to repair waste of tissue. To supply these they must needs obtain them at such times and places as they are procurable.

Animals, moreover, are influenced by the surrounding medium and environment generally, and light especially, as well as temperature, often cause uncomfortable sensations.

Many hence endeavour to shun excess of light, and, in so doing, seek night or cool twilight to perform their active functions.

By dependence upon one another for sustenance, by precautions of safety against enemies, and occasionally by seasonal occurrence of procreative faculties, or the rearing of offspring, and by other economic reasons, nocturnal habit may be acquired, retained, and ultimately transmitted.

The organs of sense, more particularly touch, hearing, and sight, usually become highly irritable, and, from lowest to highest animal forms, sensory apparatus gets specialized. By slight alteration in textural qualities functional intensity is superinduced, and touch almost amounts to a sixth sense.

In a number of cases the same group has diurnal and nocturnal representatives; and occasionally, so far as research has yet shown, no good reason can be given for nocturnal habit.

Lastly, communities of animals, like human beings, are doubtless influenced in a variety of ways; and the inherent tendency to aberration, but absolutely from physical causes not demonstrable, may act and react in a manner with which we are yet unacquainted.

ON THE DISCOVERY OF AN OSSIFEROUS CAVERN NEAR CAPPAGH, CO. WATERFORD.

By RICHARD J. USSHER.

THE discovery of a cave containing remains of man associated with those of Irish Elk and other animals, is an event of such interest to naturalists that no apology seems needed for bringing the particulars to the notice of the readers of 'The Zoologist.'

In April last, during a visit of Professor Leith Adams, who had on two occasions explored the Shandon cave, about five miles off, I went prospecting with him for a fresh find in my more immediate neighbourhood. We selected what proved to be a well-worn tunnel running into the face of a limestone knoll that rises some thirty feet above the general level of the valley of the Finisk River. When we commenced our digging, this cave was nearly filled to the roof, but it has since turned out to be about eight feet high, and about eight or ten wide. The first deposit we came to was dark brown earth, in which we found a broken human skull and a profusion of broken bones representing the following animals:—Ox, Goat or Sheep, Red Deer, Pig, Horse, Dog, Cat, Fox, Marten, Hare, and Rabbit. It was not surprising to find any of these, but as it shewed that the cave had long been the abode of man, or of animals that brought the bones in, we dug deeper. All the animal remains we had yet met with looked fresh and yellow, but as we dug down we came upon a stratum of peculiar grey earth, containing much carbonate of lime. In this, bones of a very different aspect turned up; blackened, ancient-looking bones, with dendritic markings, as if small snails had been coursing over them. Some of these Professor Leith Adams considered to be bones of the Irish Elk, which, he told me, had never been found *in a cave* in Ireland before. This was soon confirmed by our finding portions of the antlers of this animal, and subsequently more bones, unmistakably those of the Elk. But what had split these, especially the shin bone, which is the hardest in the skeleton and the most suitable for bone tool-makers? There it was, cleft in two, through joint and all, with flakes torn from it, and one long splinter left projecting from what remained. There was enough of this bone to show that it could have belonged to the Irish Elk alone. But it was not the only instance. With it were a number of split bones, and one which was long and rounded. This latter is not of the

natural shape of any bone, but appears to have been shaped for an awl or piercer by some ancient dweller in the cave. The groove along its side shows that it is made from the shin, probably of a Deer, and its surface is blackened like the others, one of which is the scapula of a Bear. Soon, other bones of the Bear turned up, blackened in the same way. I separated the "old bones," as we called them, with care from those in the upper stratum, and we found among the former, on examination, a human vertebra and finger-bone. The stones from this stratum were watched as they were thrown out, and, as might be expected, they afforded more indications of human occupation. Some were rounded stones broken in two, with the flat surface worn by rubbing or grinding. Others had edges more or less sharp, but chipped as if used for cutting or cleaving. Nor was this all. Throughout both these strata we found pieces of burnt wood, and about half-way down through the second stratum occurs a marked line, like an old floor, black in places with charcoal.

This, however, was not the lowest horizon inhabited by the cave-men, for, far below the black line, we found more charcoal, not only in the second stratum, but deep in that below it. Almost from the commencement of our digging we had come upon huge blocks of stalagmite of a larger size than I had ever seen before, but disconnected, as if an old floor of stalagmite had been broken up and the fragments tossed about. As we got deeper, below the two strata above-described, we found the stalagmite blocks embedded in a pale, sandy earth, forming together a third stratum. Yet even in this the charcoal appeared. Lower again, we came on a portion of the stalagmite floor that had not been broken up, but remained *in situ*. To this the crow-bar was applied. Surely, I thought, we shall find nothing here. Yet, still out of the very stalagmite itself, and from under it, we took more bones, and teeth, too; whole jaws of a large Bear, with both canine and molar teeth, the bones of his limbs and feet, vertebræ and ribs. These were of a pale buff-colour like the stalagmite, and required a glue-bath to render them durable, as they were very brittle. But we had not yet done. Under the floor of stalagmite we picked out an astragalus of Irish Elk that looks as large beside a similar bone of an Ox as a hen's egg would look beside a pigeon's; also a bone of deer, which Prof. Leith Adams suspects to be Reindeer, was found in this deep position.

Having undermined a portion of the rock on one side of the cave, we observed a cleft above it widening. We hurriedly drew back, and it was well that we had timely warning, for soon the mass tumbled down, filling the space where we had been digging. But this revealed a new object of interest. On the upper surface of this mass, which had been separated from the solid rock above by a narrow fissure, lay a bone, like the bones in stratum No. 1, certainly, from which it may have fallen into the crevice. This, on being washed, proved to be a tool with a chisel-edge, ground down on both sides. We now forsook the interior, encumbered by the fallen mass of limestone, and began turning up the soil at the entrance of the cave. We had not dug long when my friend cried out, "A celt!" picking up a dark greenish stone beautifully formed into an axe-head. There were no marks of chipping on it, but it had been carefully ground-down with the greatest regularity until it resembled the head of a small American axe, with neat edge and sides. It is four inches and a half long by two inches and five-eighths at its broadest part.

On resuming my excavations in May I found, close to this spot where lay the "celt," and in the same upper stratum, a large bead three-quarters of an inch broad and a little more than a quarter of an inch thick, but not symmetrical. When the crust of earth fell off it I found that it was transparent and of the colour of burnt sugar. It is believed to be amber. As I dug on in the cave two more worked objects were found: the first, a bone with a neatly-cut hole running through it transversely; and the other, a broken shaft like that of an arrow, only that the one remaining barb seems to point the wrong way, and seems to have been cut into at its base by string. But a more elaborately-carved article was found deeper down in a recess behind a mass of stalagmite, into which it may have fallen or been carried down like the bone chisel. This was a knife-handle, ornamented on its four smoothed sides with concentric circles, cut as if with compasses. It is hollow, and evidently held an iron blade, as it is stained with rust.

One more remark on the animal remains. As was natural in an Irish cave, we found bones of the omnipresent Pig throughout, but whether the tooth and toes which I found at a depth of seven feet, together with bones of Bear, can be dignified by the appellation of "wild boar," I must leave to others to determine.

OCCASIONAL NOTES.

BLACK RATS IN NORTH LANCASHIRE.—On the 15th and 16th of June I received four specimens of the Black Rat (*Mus rattus*), including an old female and three young ones, which had been trapped in the ship-building yard in this town. Apart from the colour (a greyish black), the extreme prolongation of the tail, ears, and nose would be sufficient to distinguish them at a glance from the ordinary brown species (*Mus decumanus*). The specimens in question have been set up, and form an interesting addition to the collection of the Barrow Naturalists' Field Club.—W. ARTHUR DURNFORD (Barrow-in-Furness).

ANECDOTE OF THE SPOTTED FLYCATCHER.—I am indebted to my friend Mr. Edward Fountaine, of Easton, Norfolk, for the relation of the following circumstance, which occurred in that parish on the 11th July:—A pair of Spotted Flycatchers had a brood of young ones in a nest built against the wall of a gentleman's house, and were, as usual, tame and familiar, and fed their young freely, undeterred by the presence of bystanders. On the day above mentioned, the gentleman I have referred to himself fed the young Flycatchers with a few flies, which they readily swallowed; but on returning to the nest a quarter of an hour later the young birds were all found on the ground, dead, and with a small hole (apparently pecked), in the head of each. One of the old Flycatchers was shortly afterwards seen at the spot with raised and ruffled feathers, and the nest was observed to be partly destroyed. This occurred about the middle of the day, when no four-footed vermin would be likely to be prowling about, and the inference seems to be that the old birds destroyed their brood in consequence of an unfeathered biped having presumed to feed them.—J. H. GURNEY (Northrepps, Norwich).

SUMMER MIGRANTS IN THE ISLE OF WIGHT.—Though comparatively few migrants have visited us this season, Nightingales have been unusually abundant, particularly in the Undercliff, to which they may have resorted for shelter, the weather having been very severe throughout the month of April. However, from the middle of April till the middle of June they were in constant song; and on the 8th of the latter month they were to be heard in all directions, more particularly at St. Lawrence, a favourite resort, the banks and terraces beneath the shelving cliffs being dotted and patched with underwood and brier, matted and overgrown with a profusion of honeysuckle, traveller's joy, and wild hop, fringed with a luxuriant growth of herbage; so that one may be within a few yards of the songster without seeing it. Not so in some parts of Kent, where they

frequent the oak woods, and may often be seen, as well as heard, perched on leafless lower branches.—HENRY HADFIELD (Ventnor, Isle of Wight).

THE SURF SCOTER IN ORKNEY.—A specimen of this handsome North American duck was obtained by me in Orkney, in February, 1876, and I believe no record of the occurrence was made in 'The Zoologist' at the time. [It was recorded in 'The Field,' 19th February, 1876.—ED.] It is well known that this bird is occasionally to be met with amongst the sounds of this group of islands, but as regards the frequency of the occurrence a good deal of uncertainty seems to exist. For part of this Messrs. Baikie and Heddle have to answer, as in their work they describe them as frequenting the sounds in small flocks during the winter. This statement has been copied by other writers, and so the error has a good chance of being perpetuated. It is, of course, a case of mistaken identity, the Velvet Scoter being the bird met with in the way mentioned. As regards the Surf duck, there can be no doubt that occasionally—I believe a careful observer would be able to say almost annually—specimens are to be met with, in some place or other, amongst the bays and channels with which this northern group is so indentated. [Dr. Rae has so stated in 'The Field,' 18th March, 1876, remarking, "In the latter part of September or during October I have seen one or more in Orkney for the last ten years in the large bay which separates Kirkwall from Firth and Rendall."—ED.] Where the Velvet ducks are wont to congregate the Surf Scoter is most likely to be found, since it seems to be fond of company. [This is confirmed by Dr. Rae in the note above referred to.—ED.] A female bird might very easily escape notice; but not so the male, the white patches on head and neck render it recognisable at a considerable distance, even when surrounded by the Velvet ducks, so closely resembling it in general appearance. My own experience of the species is limited to two examples, which, however, considering the limited number of British specimens referred to in the 'Handbook of British Birds,' is a fair number to have come under the observation of one person, and makes one inclined to think that the list given might be enlarged. In addition to those which I myself saw "in the flesh," I have knowledge of two others. As to the birds to which I can refer as an eye-witness: in February, 1875, while stopping at Stromness for the purpose of collecting, I went down Hoy Sound towards the island of Bara in a yawl, knowing that the sound between it and Rysa Little was frequented from October to March by numbers of the Velvet Scoter. The first lot we fell in with consisted of four birds, just off the small semi-detached N.W. corner of the island known as the Calf of Bara. On getting near I saw a white-headed bird amongst them, which I at first took for a Long-tailed Duck, *Harelda glacialis*, which also frequents this sound; but soon there was no mistaking the bird's identity—it was an adult male Surf Scoter. We sailed up within thirty yards before the birds

took wing, the stranger seeming particularly tame, and being the last to leave the water, affording as it did so an easy cross-shot. It fell to my first barrel, but instantly diving came up astern of the yawl, and flew off as though not touched; the second barrel also had no effect in stopping its career. The boatman and I watched its flight, nevertheless, and both saw it fall with a splash about a third of a mile away, but on getting to the spot, which we were not long doing, could see no more of it, although the water under the lee of Rysa was as smooth as glass; nor could I hear any more of it during the time I was then in Orkney. In February of the next year, 1876, I was at Stromness again, and the first fine day,—which rarely occurs in an Orkney winter,—the tides suiting, I started again down the sound of Hoy to see if another North American stranger should chance to be amongst the Velvet ducks. This time I took the precaution of towing down a gunning-punt astern of the yawl, with a hundred-pound gun, feeling considerable distrust of the powers of a small gun to stop such a tough customer as I had met with the previous year. I was again fortunate enough to find one, within half a mile of the place where the former bird had occurred. About a dozen Velvet ducks were swimming in a bay formed by the island of Rysa, and on approaching these with the punt I found a Surf Scoter in company with them. On getting up within shot this bird separated itself from the rest, and as it seemed very tame, and the big gun was turned full on it, affording little chance for escape, even if it suddenly rose, which the Scoter has a difficulty in doing. I watched it a bit from the punt before pulling the trigger-line. The flock of Scoters were now some distance away, when one of the birds left the others and swam rapidly towards the Surf duck; thinking this might be a female, I waited for the birds to get in line, and fired just before they crossed. When the smoke cleared one bird was floating dead upon the surface, and almost immediately the other came up from a dive and flew off. I was afraid at first that last year's misfortune had been repeated, but on getting up to the dead bird I had the pleasure of picking up an adult male Surf Scoter, in most perfect plumage. It had luckily escaped much damage from the storm of shot (17 oz.) from the punt-gun, a single pellet having passed through the lower portion of the elongated white patch on the nape of the neck. I felt less surprise at the failure of my small gun on handling the wonderfully thick soft and velvet-like plumage. As for the other two specimens I heard about in Orkney, one of them is in the museum at Stromness, in a most miserable state of preservation, having suffered severely from moth and damp. In fact, had I not been expressly told to look out for a Surf Scoter, I might easily have passed it over without notice; nor is its history very satisfactory, an uncertainty existing as to the place in which the bird was obtained. I should scarcely have made mention of this bird had not the late Mr. Joseph Dunn assured me that the birds in the museum were all local specimens, and

that he had no doubt of this one having been obtained in the vicinity, but he could say nothing definite about it. The authenticity of the remaining bird, however, is undoubted, Mr. Dunn having shot it himself very near the same spot in which my two specimens were met with. I questioned him closely concerning the occurrence of these birds amongst the Orkney group, knowing what an experience he had had there. He was always very careful in his ornithological statements, and in this case contented himself with declaring that he had only got that one specimen during his long residence at Stromness; he might have seen others,—in fact, he hinted that he did see them occasionally, but preferred to make positive mention only of the one he had actually obtained; he appeared to think these birds very wild and difficult to get within shot of, my experience in this respect conflicting with his, the two I met with being particularly tame. In addition I made enquiry of the boatmen who live on the low eastern end of Hoy—locally known as “Walls”—bordering on the sound of Fara, a spot much frequented by the Velvet ducks. These men declared that amongst the black ducks they occasionally see a strange-looking one with a white head, but “not every year.” The year following I was again in Orkney, but saw no Surf-duck, the weather being so unfavourable that during six weeks’ stay I was only able to get down to Bara once. Since that time I have heard every year from the Stromness boatman, James Sutherland, who was with me on the two occasions, and who accompanies any accidental visitors to that town intent on sporting, but he has never since that time seen a similar bird; his visits, however, would probably be limited to two or three annual trips,—scarcely a fair trial of the question,—and there are several other localities in Orkney quite as likely to reward a search—notably so some of the water to the northward of Kirkwall. On the whole I am inclined to believe that the Surf Scoter not very unfrequently (if not every year) pays visits to the Orkneys.—T. M. PIKE (Malvern).

[In addition to the specimens referred to by Mr. Pike as recorded in the ‘Handbook of British Birds’ (twelve in number), and to those now mentioned by him, may be noticed two others recorded by Capt. Clark-Kennedy in ‘The Field’ of March 11th, 1876, one of which was obtained at Longhope, Hoy Island, in 1872, and the other at the Brig of Waithe, at the entrance of Loch Stennis, Stromness.—ED.]

EARLY MENTION OF THE HOOPOE AS A BRITISH BIRD (A. D. 1395).—Amongst the documents preserved in the muniment room of Merton College, Oxford, is “An Account of the Charges incurred at the Determination Feast of Richard, son of Thomas Holand, half-brother of Richard II., in February, 1395.” From internal evidence it would appear that the feast was conducted by the University. In this curious document an inventory is furnished of the bread and meat, poultry, game and other birds, purchased

for the occasion, and the prices paid for the same. Under the heading "*Empcio poltriæ et volatiliûm*," we read:—"Et in v gallinis emptis, pretium capitis ijd., xd. Et in iij duodenis caponum emptis pretium xij^{ae} ijs. ixs. Et in iij xij^{is} de anatibus emptis pretium xij^{ae} ijs. viijd. . . . Et in diversis volatilibus in grosso per diversas vices, vs. Et in xxiiij gastrimargiis [sc. Woodcocks] emptis pretium capitis iijd., vjs. vijd. Et in duobus perdicibus emptis pretium capitis iijd. ob vjd. Et in iij malards et iij teles emptis xxjd. Et in xiiij plovers emptis pretium capitis iijd., ijs. vjd. Et in xlvij perdicibus emptis xjs. ix d. pretium perdicis iij ob. Et in vij *upupis* [sc. Hoopoes] emptis pretium capitis ijd., xiiijd. Et in xvj snytes emptis in grosso, xijd. Et in xx. xij^{is} avium, viz. owseles, thresshes, et feldefares, xs. Et in avibus emptis xd. Et in xxiiij snytes emptis in grosso xvijd. Et in v anatibus de ryver [sc. 'wild-ducks' as distinguished from the tame birds above referred to] emptis xvijd. Et in iij duodenis avium et v perdicibus emptis xxjd. Et in xxiiij perdicibus emptis de uno homine de Sare. pretium capitis ijd., iijjs. . . . Summa."

The document from which this extract is taken—a curious jumble of Latin, French, and English—has been printed by Professor Thorold-Rogers at the end of the second volume of his 'History of Agriculture and Prices in England' (pp. 643-647). If the word "*upupis*" be intended to apply to the Hoopoe (*Upupa epops*),—and I know not to what other species it could be applied (the price paid precluding the idea that the writer confounded the name "Hooper" with "Hoopoe"),—it is remarkable that these birds were so common in England in 1395, that as many as seven might be obtained at one time for twopence apiece. The month of February, too, strikes one as being an unusual time of year at which to find them here, although a few other instances are known of their occurrence here in winter. They fetched the same price apparently as fowls, and were cheaper than woodcocks. What their gastronomic properties may be I am unable to say, but from what I have observed abroad of their habits and the nature of their food, I should not have expected to find them set down amongst "the delicacies of the season."—J. E. HARTING.

NESTING OF THE STOCK DOVE.—I think the habit of nesting early in this bird has somewhat escaped the notice of ornithologists. About the second week in March they may be seen performing the prettiest aerial movements possible in the vicinity of their nesting-haunts. They keep flying round and round in circles, generally at the beginning of the flight, rising up perpendicularly in the air at an altitude of several feet from their favourite perch, smartly striking the wings together with a loud clap, which can be heard a considerable distance. Often by the second week in April, or by the beginning of the third week, the young ones are fledged, as was the case this spring, though one of unusual severity. The nest is generally

placed in a hole in a tree, but other situations are occasionally fixed on; I have found it exposed to the air on the top of pollard-ash and willow trees. I once met with this species nesting on the floor in a belfry; there were two or three nests in close proximity to the bells; and the late Mr. J. J. Briggs found them building underneath the railway-bridges overspanning the Trent. They will also nest in rabbit-burrows, and Mr. Harting discovered them nidifying in cliffs facing the sea ('The Field,' 14th April, 1866, and 'Birds of Middlesex,' p. 134, *note*), and other observers have testified likewise. The nest of the Stock Dove, however, may also be met with very late in the season; I found two fresh eggs in a hollow ash tree on the 2nd October, 1875. I am informed, on good authority, by a collector, that he has found this bird's eggs inside a deserted Magpie's nest. I have noticed the Stock Dove as plentiful in Lincolnshire, Nottinghamshire, Bedfordshire, Buckinghamshire, and Oxfordshire. It breeds abundantly in all five counties, and may often be called common.—C. MATTHEW PRIOR (The Avenue, Bedford).

[During the summer of 1865 a pair of Stock Doves nested in the belfry of the old church at Kingsbury. The following summer they returned and again had a nest there. We secured the young and reared them in an aviary, that the identification of the species might be placed beyond doubt. The details will be found recorded in 'The Ibis' for 1867, p. 380.—ED.]

GULLS BREEDING IN WESTMORELAND.—It is perhaps not generally known that a considerable number of Lesser Black-backed and Herring Gulls (*Larus fuscus* and *L. argentatus*) breed regularly on Foulshaw Moss, near Arnside. Twenty years ago the colony was of small dimensions, the nests being placed, comparatively speaking, close together. Since that time, owing apparently to all the eggs having been taken on one occasion, the birds have spread out over an area of several hundred acres, and, having in the meantime largely increased in numbers, there are probably at present not less than two or three hundred broods of young birds. The eggs were laid this year about May 24th, a week or two later than usual. The Lesser Black-backed birds seem to exceed the Herring Gulls in the proportion of nearly ten to one. The most noteworthy fact in connection with these Gulls is the immense havoc they cause amongst the fish in the neighbouring river, the Kent. Young salmon and sea-trout up to a couple of pounds or more in weight fall victims to their attacks in large numbers; and the remains of these, as well as of crabs, shell-fish, &c., which strew the moss in the vicinity of the nests, testify to their extreme voracity. The Grouse, which are tolerably plentiful in the locality, are being gradually expelled from their original haunts, and, though it does not seem to have been proved that the Gulls will actually devour the young birds (possibly the resemblance to their own progeny would prevent this),

if nothing is done to check the increase of these depredations in the future, the moss will eventually cease to be of much value for sporting purposes. In addition to the Gulls and Grouse, Wild Ducks, Teal, Curlews and Snipe breed on the moss; and a short distance off, across the river, is a good-sized heronry. It is scarcely necessary to add that all these birds are carefully preserved by the owner of the property.—W. ARTHUR DURNFORD (Barrow-in-Furness).

THE GREAT BUSTARD FORMERLY IN LINCOLNSHIRE.—We learn from Mr. Cordeaux's 'Birds of the Humber District' (pp. 83-85) that the Great Bustard, "formerly inhabiting the desolate wolds of Lincolnshire and Yorkshire, has passed away, leaving in the former county scarcely a tradition of its presence." One such tradition, if it may be so called, has been preserved in a book where one would least expect to find it,—namely, in Boswell's 'Life of Johnson,'—and as Mr. Cordeaux has not referred to this notice in his remarks on Lincolnshire Bustards, I will quote the passage to which I allude. It occurs in a letter dated 9th January, 1758, addressed by Dr. Johnson to his friend Bennet Langton, of Langton, near Wragby, and runs as follows:—"I have left off housekeeping, and therefore made presents of the game which you were pleased to send me. The Pheasant I gave to Mr. Richardson [the author of 'Clarissa'], the Bustard to Dr. Lawrence, and the pot I placed with Miss Williams, to be eaten by myself." This "game," then, was sent up to London from Langton, and, considering what the aspect of that part of Lincolnshire was at the date mentioned, the difficulties of communication, and the mode of conveyance in those days, it cannot be doubted that this Bustard, like the Pheasant, must have been killed in the neighbourhood in which the sender resided. Whether it is quite justifiable to identify the bird so called with the Great Bustard may be a question, although the probability is that this view is correct, since the smaller species has been almost invariably distinguished as the Little Bustard, while in contemporary and other notices where reference is made to "*the* Bustard" the context shows, either from the description given of plumage, size, or weight, or from some allusion to its habits, that the Great Bustard was the bird intended. I learn from Mr. Cordeaux that Wragby lies between the oolite and the chalk, on both of which ranges the Great Bustard was at one time probably not uncommon.—J. E. HARTING.

MIGRATION OF HOUSE MARTINS.—My own observations quite coincide with those of Mr. Stevenson as to the early migration of the main body of House Martins. Although contrary to what might at first be expected, their departure does not take place in this county until about the second week in September. On reference to my note-books I find that the first, and as I think, the main migratory flight departed, in 1875, on September

13th; in 1876, on September 12th. I have unfortunately lost the date for 1877, but am almost certain it was either on the 6th or 7th of September; and in 1878 on the 11th of September. For a few days previous to their departure they collect in great numbers on a projection in front of the Wesleyan Chapel, which has been a rendezvous for these birds for a number of years. On the morning of their migration they are very active; preening themselves, and performing short flights until they rise almost simultaneously for their final voyage. They fly, at a moderate height, in a south-easterly direction.—E. P. P. BUTTERFIELD (Wilsden).

BARN OWLS AND SHREW MICE.—The Barn Owl, it is generally supposed, never preys upon Shrew Mice, but on clearing out an old nesting-hole, last August, I was surprised to find among the skulls of other mice, hundreds of those of the Shrew. Many of the pellets were composed mainly of the skulls of House Sparrows, and I failed to detect the remains of any other bird. The young, when taken from the nest, thrived, and fed greedily on any sort of fish, when meat was not forthcoming. I fancy if more attention was given to the castings of Barn Owls, we should often find the Shrew in the bill of fare.—C. MATTHEW PRIOR (Bedford).

[On dissolving in warm water four pellets of the Barn Owl forwarded by our correspondent, we discovered the crania, more or less perfect, of nine mice and three shrews; nine pairs of lower jaws of mice; three pairs of lower jaws of shrews; besides fragments of the leg-bones and shoulder-blades of a corresponding number of these little animals. No remains of birds.—ED.]

WOOD WREN IN THE COUNTY OF WICKLOW.—In the month of June last, while staying at the Glendalough Hotel, I made it my object to search carefully for the Wood Wren in the oak plantations of Derrybawn, where I had previously observed the bird during three different summers. Having visited its haunts daily from the 1st of June I did not observe it until the 9th, when a couple of pairs made their appearance, and I have now little doubt that the bird breeds annually in this locality.—H. CHICHESTER HART (7, St. Stephen's Green, Dublin).

GOLDEN ORIOLE IN SUFFOLK.—At the end of May last Mr. T. C. Ellis, of Oxnead Lodge, Newmarket Road, in this city, while driving from Sudbury to Newton, saw a fine male Golden Oriole fly from a tall hedge by the roadside. He was particularly struck with the brilliancy of its colour, and from the description he gave me and his recognizing a specimen in my shop-window, there can scarcely be a doubt of its occurrence as stated.—T. E. GUNN (St. Giles Street, Norwich).

NESTING HABITS OF THE STARLING.—With reference to the remark I made relative to the Starling rearing but one brood in a season (p. 187),

I did not mean to imply that occasionally they may not rear two broods, but that these bear but a small proportion to the number which only rear one brood. It is an interesting sight to see them hurrying to and from their nests at the end of May, especially near such breeding-haunts as Eastby rocks, where every available space is occupied by a Starling's nest. All is animation. It reminds one of being in the vicinity of a wasp's nest. How is it that, if they rear two broods, we never discover the same activity on subsequently visiting their haunts? Even of the few that have young in July it is very probable that some may have had their first nest destroyed; but this remark applies with greater force to such nests as are built about our residences.—E. P. P. BUTTERFIELD (Wilsden).

SWORD-FISH ON THE NORFOLK COAST.—A specimen of the Sword-fish, *Xiphias gladius*, was captured off Sherringham, on the coast of Norfolk, in a mackerel-net, on July 14th. It measured 9 feet 6 inches from tip to tip, including the "sword," the length of which was 3 feet.—J. H. GURNEY (Northrepps, Norwich).

BOAR-FISH AT THE MOUTH OF THE HUMBER.—I have a dried example of this fish, which was captured in 1877 off the mouth of the Humber and brought alive into Grimsby. In its present condition it measures $5\frac{1}{2}$ inches in length by $2\frac{1}{4}$ in depth in front of the first dorsal. This is probably the most northern occurrence of the species on the British coast.—JOHN CORDEAUX (Great Cotes, Ulceby).

OCCURRENCE OF THE BOAR-FISH.—During the month of June last I received several notices of the occurrence of the Boar-fish (*Capros aper*) from various parts of the south and south-east coasts of England. First from Bournemouth and Weymouth, where they were found, not uncommonly, dead on the shore. Again, one of the Leigh "shrimpers" took about a dozen specimens in his trawl-net near Sheerness at the mouth of the Thames. Another haul of two specimens was made likewise in a shrimp-trawl off Harwich. None of these survived, no doubt having been too long in the trawl. Dead specimens of these were sent for me to look at by Mr. Andrew, the Aquarium fish-collector, of 25, Cambridge Terrace, Southend. He says the Essex fishermen know them as "Red Dorees," but none remember having seen them on that coast before this year.—JOHN T. CARRINGTON (Royal Aquarium, Westminster, S.W.)

MONSTER BREAM IN NORFOLK.—A monster Bream, weighing upwards of $11\frac{1}{2}$ lbs., was caught in a pond at Beeston Regis, near Cromer, on the 17th June, by Mr. J. W. Cremer. It was a male fish and very dark in colour; in total length it measured, from tip of nose to fork of tail, 26 inches;

depth, 10 inches; girth, 23 inches. This is the largest specimen of the common Bream that I ever saw or heard of occurring in England. A fine specimen was also caught by Mr. Harper in the River Yare at Thorpe, Norwich, on the 23rd June, with an ordinary line and aid of landing-net. This fish weighed $8\frac{3}{4}$ lbs., and measured 23 inches in length and $19\frac{1}{2}$ inches in girth. Both the above were sent me, and are in course of preservation. The last-mentioned specimen was a female, and after being landed in the boat voided a large quantity of ova. — T. E. GUNN (St. Giles Street, Norwich).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

June 5, 1879.—Prof. ALLMAN, F.R.S., President, in the chair.

Mr. A. D. Michael was elected a Fellow of the Society.

Prof. W. K. Parker read an abstract of a lengthened memoir "On the Structure and Development of the Skull in the Urodelous Amphibia." In this memoir several common and rare forms are worked out, the Spotted Salamander serving as a type. It is noticed that some of the so-called "skin bones" appear early, others of the investing bones appear later, and the investing cartilaginous roof of the nose comes after the ear-capsule cartilages. Some *Woodella* show a stapes which notably is absent in *Ceratodus* and *Lepidosiren*. The transformations of the *Anoura* are carried on in the plastic larva and young to a greater extent than in the *Urodela*. "There have not been wanting anatomists," says Mr. Parker, "who, failing from deficient embryological knowledge to see the meaning of this or that part, have trusted to teleological explanations, but teleological science belonging to another category of research of thought thus used becomes a misleading light—an *ignis fatuus*."

The more important portions of a fourth "Contribution to the Mollusca of the 'Challenger' Expedition," by the Rev. R. Boog Watson, was read by the Secretary, in the absence of the author. This deals with the *Trochida* and *Turbinida*. A new species of *Basilissa* (*B. oxytropis*) is also described, accident preventing its being included in the previous list. Of the *Trochus* group, the *Margarita* are many of them remarkable for beauty and for form. Of the genus *Turbo* there are few, but one species is of extraordinary beauty. The author states that the list of known species presents no such features of interest as to call for its publication at present. Here follows the diagnosis and lengthened description of *Basilissa* (one species), *Trochus* (sixteen species), and *Turbo* (three species). All now communicated are new to science. Some are from deep water, and shed light on a faunal zone not yet familiar to us.

June 19, 1879.—Prof. ALLMAN, F.R.S., President, in the chair.

Mr. Charles Holmes, of Bradford, was elected a Fellow of the Society.

The President called attention to two volumes folio 'On the British Fresh-water Fishes,' by the Rev. W. Houghton. These, recently issued, illustrate in colours all the known species, and the work forms a handsome addition to the literature of the British fauna.

The Secretary, in the absence of the author, then read a paper "On a remarkable branched *Syllis* from the 'Challenger' Expedition," by Dr. W. C. M'Intosh. This polychæte worm, *S. ramosa*, was found in the basal canals of a hexactinellid sponge dredged near Zebu, Philippines. Thread-like in thickness, the branches are intricately arranged among the meshes of the sponge, and it appears that but one head must serve for many branches. Buds and secondary buds are very numerous on the latter, and in a free female pedal bristle-tufts were observed. A fragment of a different form is suggested as possibly the male of the foregoing rare example of a truly branched annelid. They both differ in most particulars from anything heretofore recorded in science.

"On the Thorax of the Blow-fly," was the title of a paper by Mr. A. Hammond. Most authorities at present recognise the great preponderance of the mesothorax over the other two segments (prothorax and metathorax), but do not fix the limit of each. The author refers to the integumentary parts entering into the thorax of insects, as enumerated by Audouin, and also especially to the views held by Westwood, Burmeister, Lowne, and others. Afterwards he gives a full description of his own dissections and preparations, and reasons for dissenting from the majority of workers, though with evident inclination to Audouin's opinions. He concludes that, from the analogy presented by other insects, from the evidence derivable from the phenomena of developmental change, and from a study and consideration of the nervous muscular systems, all combine to show that the thorax of Diptera, as illustrated in the blow-fly, is almost exclusively mesothoracic; this conviction, be it observed, being quite at variance with that promulgated by Lowne in his admirable researches on the blow-fly.

Mr. G. Busk read a communication "On Recent Species of *Heteropora*," this being founded chiefly on material got by the 'Challenger' Expedition. Hitherto our knowledge of these Polyzoa has been derived from fossil forms, but quite lately Mr. Waters has drawn attention to a recent example in the British Museum Collection, said to be from Japan. Mr. Busk now considerably adds to our information on the living types, and enters into an account of the several structural peculiarities observed by him.

Then followed a paper by Pastor H. D. J. Wallengren, of Sweden, "On the Species of Caddis-flies (*Phryganeæ*) described by Linnæus in his 'Fauna Suecica,' with Notes thereon," communicated by Mr. R. M'Lachlan.

A paper "On the Bell-bird," by Dr. J. Murie, was taken as read.

ZOOLOGICAL SOCIETY OF LONDON.

June 17, 1879.—Professor W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May, 1879, and called special attention to several novelties, amongst which were:—two Horned Parrakeets, *Nymphicus cornutus*, obtained by purchase; a Hornbill, received in exchange May 8th, which appeared to be a second example of the species described in 1870 as *Buceros subcylindricus*; a young male Patagonian Sea-lion, *Otaria jubata*, presented by Mr. F. E. Cobb, Manager of the Falkland Islands Company, at Stanley, Falkland Islands; and a Saki Monkey, *Brachyurus rubicundus*, purchased May 24th, new to the Society's Collection.

Mr. Sclater exhibited a skin of *Ara glauca*, from Mr. Boucard's collection, obtained at Corrientes, and stated that having compared it with the *Ara* now in the Gardens, purchased in June, 1860, and hitherto named *A. glauca*, he had come to the conclusion that the living bird belonged to the allied form, *Ara Leari*.

Prof. Flower called attention to the skull of the female Sea-lion, which had lately died at the Southport Aquarium, and pointed out that it belonged to *Otaria Gillespii*, and not, as had been supposed, to *Otaria Stelleri*.

Mr. C. G. Danford exhibited and made remarks on some remarkable antlers of Deer, which he had obtained during his recent journey in Asia Minor.

Prof. Newton exhibited skins of some rare species of birds obtained by Mr. Edward Newton, in Jamaica.

Mr. F. D. Godman exhibited and made remarks on a drawing of the Manatee by Mr. Wolf, taken from the specimen lately living in the Westminster Aquarium.

Hans Graf von Berlepsch exhibited and made remarks on the skins of two varieties of the Long-tailed Titmouse, *Mecistura caudata*, which occurred near Cassel, in Germany, one of which appeared to be the same as the British form of this bird.

Dr. J. Murie read a paper on the Manatee, containing the results of his examination of the specimen which was lately living in the Westminster Aquarium. The peculiar attitudes assumed by the animal in life, the great mobility of the upper lip, and the occasional use of the limbs in feeding were noted. As regards the anatomy, the chief points dwelt on were the shape of the brain and its suppressed convolutions. The vexed question of the number of the cervical nerves and their distribution was also discussed.

A communication was read from Mr. A. H. Garrod, on the brain and on other points in the structure of the adult male Hippopotamus, which was presented to the Society by the late Viceroy of Egypt in 1850, and which died in the Society's Gardens in March, 1878.

A second communication from Mr. Garrod contained a note on the mechanism of respiration, as well as of the retraction of the head and limbs in certain Chelonia.

Dr. Gwyn Jeffreys communicated the second part of his work on the Mollusca of the 'Lightning' and 'Porcupine' Expeditions, embracing the families from *Anomiidae* to *Arcidae*. The number of species noticed was 100, of which four were new to science, and fifteen were hitherto unfigured. Particulars were given of the geographical and geological distribution of all the species, and their synonymy was discussed. Some species of *Leda* and *Malletia* were Sicilian fossils of the pliocene formation, and had not been previously known as recent or living. These species occurred at great depths, a fact which showed that the sea-bed in that part of the Mediterranean had been considerably raised since the tertiary epoch.

Mr. Edward R. Alston read a note on the *Acanthomys leucopus* of Gray, showing that it does not belong to the genus *Acanthomys*, but to *Mus* proper. As the name *leucopus* is pre-occupied in the latter genus, he proposed to call the species *Mus terra-reginae*.

Mr. W. L. Distant read a paper on the African species of Lepidoptera of the genus *Papilio*. A new species from Magila, East Africa, was described, and the name of *Papilio Hornimani* was proposed for it.

A communication was read from the Count T. Salvadori, containing further particulars of the new Pheasant from Western Sumatra which he had recently described as *Acomus inornatus*.

Messrs. Godman and Salvin gave an account of some hitherto unrecorded diurnal Lepidoptera, obtained by the Rev. George Brown in Duke of York Island and New Ireland, together with descriptions of some apparently new species.

A communication was read from Mr. F. Jeffrey Bell, being the second of the series of his observations on the characters of *Echinoidea*. The present paper contained an account of the species of the genus *Tripneustes*.

Messrs. Selater and Salvin read a paper on the birds of Bolivia, based principally upon an examination of the specimens obtained by Mr. Buckley during two expeditions into that country.

This Meeting closes the present Session. There will be no more Scientific Meetings until the commencement of the next Session, 1879-80, in November next.—P. S. SOLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 4, 1879.—H. W. BATES, F.L.S., F.Z.S., Vice-President, in the chair.

Donations to the Library were announced, and thanks voted to donors.

Mr. J. Walhouse, F.R.A.S., of 9, Randolph Crescent, Maida Vale, was ballotted for and elected an Ordinary Member. Senor Antonio Augusto de Carvatho Monteiro, 72, Rua do Alecrion, Lisbon, was ballotted for and elected a Foreign Member. Mr. C. H. Goodman, of Kearsbrook Lodge, Lesness Heath, Kent, was ballotted for and elected a Subscriber.

Mr. M'Lachlan called attention to a notice by Prof. F. A. Forel, published in the 'Procès-Verbaux de la Société Vaudoise des Sciences Naturelles' (séance du 5 Decembre, 1877), concerning certain sculptured markings on cretaceous pebbles from the shores of Lac Léman. Various theories had been propounded to explain the cause of those markings, such as the action of Algæ, Mollusca, &c. Prof. Forel had, however, come to the conclusion that they were mainly due to the action of larvæ of Trichoptera, which formed galleries over the surface, and there were larger and deeper depressions in the places where the cases were fixed. Mr. M'Lachlan had received from Prof. Forel, through Capt. Marshall Hall, certain of these larvæ in alcohol, and two plaster casts of small blocks (exhibited), one of Jurassic limestone, the other of ordinary white chalk, the latter being one of several placed in the lake by Prof. Forel on the 12th March, and taken out on the 26th November following, and on which he had scratched his initials; these scratches had been deepened in some places by the action of the larvæ, which apparently were those of the genus *Philopotamus* in the family *Hydropsychidæ*.

Mr. Meldola suggested that the depressions in the pieces of chalk and limestone might have been produced by the solvent action of the water charged with carbonic acid, which issued from the galleries of the larvæ, a circulation of oxygenated water being necessary for their respiration, and after being used for this purpose the effluent water would naturally contain more carbonic acid than before its entry into the galleries; but this explanation would not hold good if the casts themselves had been directly acted upon by the larvæ.

Mr. J. S. Baly communicated a paper entitled "An Attempt to point out the Differential Characters of some closely-allied Species of *Chrysomela*, chiefly those contained in Suffrian's 11th group; also Descriptions of some hitherto uncharacterised forms belonging to the same and other Genera of the Family."

Prof. Westwood communicated two papers, entitled "A Decade of new *Cetoniidæ*," and "On some unusual Monstrous Insects."

Mr. W. L. Distant read a paper entitled "Contributions to our Knowledge of the Hemipterous Fauna of Madagascar."

Sir Sidney Saunders communicated some notes from M. Jules Lichtenstein, of Montpellier, describing the metamorphoses of the blister-beetle, which, after repeated failures for many years, he had recently succeeded in rearing from the egg.

Mr. Meldola communicated a translation of a paper by Dr. Fritz Müller, published in 'Kosmos,' May, 1879, and entitled "*Ituna* and *Thyridia*; a remarkable case of Mimicry in Butterflies."

With reference to Dr. Fritz Müller's remarks on the inexperience of young birds, Mr. Jenner Weir stated that from the numerous experiments which he had made on the subject of larvæ which are eaten or rejected, he had always been profoundly impressed with the utter disregard paid by birds to larvæ which were inedible. He had never but once seen a distasteful larva even examined by a bird. When, day by day, he had thrown into his aviary various larvæ, those which were edible were eaten immediately; those which were inedible were no more noticed than if a pebble had been thrown before the birds. It was Mr. Weir's opinion that the experience of birds in this respect had become hereditary in the species, and was not the result of the experience of individual birds, but was rather to be regarded as an act of "unconscious cerebration."

Mr. Bates, whilst acknowledging the great value of the numerous facts adduced from his own personal observation by Dr. Fritz Müller, could not agree with him in his proposal to separate, as a distinct family, *Ituna* and *Lycorea* (with *Danaïs*) from *Thyridia* and the remainder of the *Ithomia* group; the characters mentioned by him only went to prove that *Ituna* and *Lycorea* were the connecting links between *Danaïs* and the *Ithomiæ*, thus justifying the views of those Lepidopterists who first defined this important group nearly twenty years ago. With regard to the still incompletely solved problem of mimicry, he could not see that Dr. Müller's explanations and calculations cleared up all the difficulties. The numerous cases where species which are themselves apparently protected by their offensive secretions evidently mimic other species similarly protected still form a great stumbling-block. The excessive complexity of the question must be evident to all who read Dr. Fritz Müller's writings on this subject. The phenomena with regard to the *Heliconidæ*, stated broadly, were these:—In Tropical South America a numerous series of gaily-coloured butterflies and moths, of very different families, which occur in abundance in almost every locality a naturalist may visit, are found all to change their hues and markings together, as if by the touch of an enchanter's wand, at every few hundred miles, the distances being shorter near the eastern slopes of the Andes than nearer the Atlantic. So close is the accord of some half dozen species (of widely different genera) in each change that he (Mr. Bates) had seen them in large collections classed and named respectively as one species. Such a phenomenon was calculated to excite

the interest of the travelling naturalist in the highest degree. Although the accordant changes were generally complete, cases occurred in which intermediate varieties were still extant, and the study of these had given him, when he was in South America, the clue to an explanation which, however, does not embrace the whole of the problem.

July 2, 1879.—Sir JOHN LUBBOCK, Bart., M.P., V.-P.R.S., President, in the chair.

Donations to the Library were announced, and thanks voted to donors.

Mr. Vincent Robert Perkins, of 54, Gloucester Street, South Belgravia, was ballotted for and elected an ordinary Member.

Mr. S. Stevens exhibited living specimens of *Tillus unifasciatus* and *Teretrius picipes*, from the same fence, at Norwood, where these insects were captured last year, this being the fourth season of capturing the first, and the third season of taking the second species in this locality. (See also Proc. Ent. Soc., 1878, p. xli).

Mr. Mc'Lachlan made a further communication respecting the sculptured pebbles from Lac Léman. He had received from Prof. Forel an actual water-worn limestone pebble from the lake, which did not, however, show any distinct sculpturing, but on it were the covered channels formed by Trichopterous larvæ. A number of the perfect insects forwarded (with larvæ and pupæ) by Prof. Forel proved to be *Tinodes lurida*, Curt., a common insect generally on the margins of lakes and rivers.

Mr. W. L. Distant exhibited a specimen of *Papilio Hystaspes*, Feld., taken by Mr. R. E. Cole at sea during a calm, thirty miles from Singapore and nine miles from the nearest land. This butterfly, found both at the Philippine Isles and Malacca, is generally considered as a variety or local race of *Papilio Helenus*, Linn., round which are also grouped a number of other closely allied forms. Mr. Distant suggested that if, as in this case, one of these forms could be found so far at sea during a calm, it could easily be realized how in such a region of sudden storms involuntary migration must frequently take place, and the differences in the conditions of the new habitats might be sufficient to produce the many constant but varietal forms of this species.

Mr. William Cole exhibited a remarkable variety of *Pyrameis cardui*, taken at Buckhurst Hill, Essex, in June.

The Secretary exhibited, on the part of Lord Walsingham, some specimens of a species of Tipulidæ (*Bittacomorpha clavipes*, Fabr.), remarkable for possessing greatly enlarged tarsal joints, captured at Pitt River, California.

Sir Sidney Saunders communicated some additional explanation, received from M. Jules Liechtenstein, of Montpellier, respecting the rearing of the blister-beetle, *Cantharis vesicatoria*.—R. MELDOLA, Hon. Secretary.

NOTICES OF NEW BOOKS.

The Wild White Cattle of Great Britain: an Account of their Origin, History, and Present State. By the late Rev. JOHN STORRER, M.A., of Hellidon, Northamptonshire. Edited by his Son, JOHN STORRER. 8vo, pp. 378. London: Cassell, Petter and Galpin. 1879.

CONSIDERING the antiquity of the race of Wild White Cattle, a few herds of which still survive in England and Scotland, and the interest which attaches to their origin and history, it is somewhat surprising that, until the appearance of the present volume, nothing like a complete account of them had been published.

It is true that various allusions to the primitive race of wild cattle in the British Islands may be found in the works of the older historians, as FitzStephen, Hector Boece, Leslie, and Sibbald; the question of their origin and affinities has furnished a theme for several eminent palæontologists, as Professors Nilsson and Rütemeyer, Sir Charles Lyell, Dr. J. A. Smith, and Prof. Boyd Dawkins; while accounts of particular herds may be found in the works of various antiquarians and county historians, amongst whom we find such well-known names as Leland, Erdeswick, Leigh, Raine, and Whittaker. Nor have naturalists at various times omitted to notice them, as testified by the works of Pennant, Bewick, Bell, and Mr. Darwin. But the earlier references, generally speaking, are vague and unsatisfactory, chiefly because founded upon hearsay evidence; while the later accounts, although in many cases extremely valuable, are more or less fragmentary and incomplete in their nature, necessitating careful consideration and comparison before one can proceed to generalize from them.

It devolved upon the late Mr. Storrer, from these and other sources, to collect and arrange all such information concerning wild cattle in Great Britain as seemed to him reliable and trustworthy, and the result is now given to the world in the book before us.

If the arrangement of the material at his command is not so good as it might have been, this doubtless must be attributed not so much to the inability of the author to deal with his facts, as to the regrettable circumstance of his demise before the completion of his labours. Under the *nom-de-plume* of "Historicus," the late Mr. Storrer was well known as an experienced writer on the various breeds of domestic cattle, particularly "Short-horns," and his opinions were always received with deference by those who claimed with him to be authorities on the subject. Had he lived to complete the present work, it may be assumed that in several respects it would have been materially improved. "The text of the book," says the editor (his son), "has been left by me in all respects as Mr. Storrer left it, with the sole exception of a few merely verbal corrections. A few notes it seemed well to add are carefully distinguished. In every case I have been most particular to preserve the exact meaning of the author, even to the minutest shade." In this respect, we think, the editor has exercised a wise discretion.

Commencing with an examination of the questions affecting the origin of cattle, the European races, and the fossil species, the author investigates the history of the Urus in ancient Britain, and the early notices which he has met with of wild cattle in England and Scotland. Passing from forest to park, he dwells on the gradual extinction of wild animals in forests, while, owing to the protection afforded them, they still survive in parks, and quotes such authors as have contributed to a history of so-called wild cattle in the semi-domesticated state. To the Chillingham herd no less than four chapters are devoted,—doubtless because it has been noticed by previous writers more than any other, and after dealing less fully with the herds of Chartley, Lyme Park, Burton Constable, Somerford, Wollaton, Gisburne, Middleton, and Gunton Park, he passes on to a consideration of the extinct and existing Scottish herds, and, in an "Appendix," gives a list of localities where wild white cattle or their domestic descendants are (in his opinion) proved to have existed.

This list is a long one; much longer, indeed, than most people would suppose. In Scotland alone eleven places are named as having at one time harboured wild cattle, although in

two only (Cadzow and Kilmory) are herds to be found at the present day.

In England, evidence more or less convincing is adduced to show the former existence of wild cattle, or herds in parks, in twenty-eight different places, in all of which, save three, they have either died out (Mr. Storrer thinks from too closely interbreeding) or have been purposely destroyed. But in addition to the three parks which are now generally known to contain herds, *viz.*, Chillingham, Chartley, and Lyme, we find, under the head of "The Gunton, Blickling and Woodbastwick Herds (Norfolk),"—all of which are thought to have been derived from the ancient wild herd of Middleton, in Lancashire,—the statement that "the first of these died out some thirty years since; the two latter still exist, more or less pure. All were domesticated."

All these existing herds Mr. Storrer personally visited, and his description of these visits is very entertaining. In stating (at page 163) that "Mr. H. H. Dixon ('The Druid') was the last person who published any account of the herd [Chillingham], in his 'Saddle and Sirloin,' in 1870, having seen it a few years previously," both Mr. Storrer and his editor have overlooked the article by Mr. A. H. Cocks, which appeared in the pages of this journal only last year, entitled, "A Visit to the existing Herds of British White Wild Cattle,"* a perusal of which would have furnished more recent statistics than those given in the present volume.

We have not space at our disposal to examine in detail Mr. Storrer's arguments. Suffice it to say that, although we are unable to agree with him in all his conclusions, and consider that here and there he has laid too much stress upon merely presumptive evidence, he has, nevertheless, produced a book which conveys a considerable amount of information, collected from various sources, and which should prove almost as interesting to the general reader as to the professed naturalist.

* 'The Zoologist,' 1878, p. 273.

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THIRD SERIES.

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THE NATURALIST IN NIDDERDALE.

BY JOSEPH LUCAS, F.G.S.

IN Yorkshire there are three well-known hills that bear the name of Whernside, all about 2000 feet in elevation. Two of these—Great Whernside, 2300 feet, and Little Whernside, 1984 feet—lie together, fourteen miles south-east of the third Whernside, which is near the head waters of the Ribble, the Lune, the Ure, and the Wharfe, on the backbone watershed which sends its waters to the North Sea on the one side, and the Irish Channel on the other. Great and Little Whernside lie near the headwaters of the Cover, a tributary which joins the Ure at Middleham, twelve miles north-east from its source; and the Nidd, another tributary of the Ure, which joins the main river near York, thirty-five miles south-east from its source. On the west, Great Whernside looks down upon the village of Kettlewell, in the far-famed dale of the Wharfe, and up the lovely Langstrothdale; whilst above these, in the middle distance, looms the stupendous Pen-y-gent, having the truncated sugar-loaf shape characteristic of all the more conspicuous eminences on the Pennine chain.

This part of the valley of the Wharfe derives its beauty from being cut deeply into the mountain limestone, whose regular terraces and lines of cliffs form one of the most pleasing features in the dale. Though this limestone reappears in the valleys to the east, it is too low in their beds to give a character to the scenery. With these exceptions all the hills and slopes are formed in the millstone-grit formation, which ranges on a huge anticlinal line from Derbyshire into Scotland. It is this formation that

supports upon its sandstones and shales that remarkable extent of heather-covered moor and peat which occupies a belt of country, broken only by valleys, for a length of 200 miles, being in places thirty miles wide. The line of demarcation between the vivid green grass of the limestone and the black heather-covered peat of the millstone-grit is generally as well defined as that of the formations themselves.

The basin of the Nidd above Hampsthwaite includes an area of eighty square miles; and though some allusions will be made to the more southerly part of this area, it is the more northerly and more elevated parts that will be particularly described. For sixteen miles from Great Whernside the valley proper is nowhere more than one mile wide from ridge to ridge, and is from 500 to 800 feet deep, forming, as it were, a deep groove in the vast easterly-sloping heather-covered moorland. South of that the valley becomes more open, the height of the surrounding hills falls, and the moors, which retreat to the west, disappear altogether on the east side. Save for the magnificent Brimham Rocks, the valley below this is tame and uninteresting. .

Between the Wharfe near Otley and the Nidd below Pateley Bridge, there is a great extent of wild half-cultivated land, almost all of which has formerly been under the plough. Some of this tract is yet wild moorland, in which lies the ancient enclosure of Haverah Park, but the rest has long since been turned into grazing land. Over this and surrounding districts, farms fitted up for agriculture are now standing half ruinous, and it is no uncommon thing to see a little shed of logs thatched with hay for the shelter of a few calves put up in one corner of a large roofless barn built for the reception of hay and grain. Fences have been allowed to go to ruin, or gaps have been intentionally formed in them to give the herds of cattle now grazing there a larger run.

Till about fifty years ago long-horned cattle were kept in the dale. They were black-and-white, and blue. These were replaced by shorthorns, whose chief merit lies in the fact that in a year and a half they will put on as much flesh as an ordinary beast will in three. In addition to this they "feed" better, and grow fat on pastures where an ordinary cow would remain poor. For these reasons they are well adapted for keeping for a year and a half or two years on these moorside farms. Since the decline of agriculture in the dale their numbers have very much increased all along this

part of the lower slopes of the Pennine chain, which may truly be called the nursery of the famous breed of Yorkshire shorthorns. The cattle are subject to a disease which causes them to swell up about the eyes and tail, when they are said to be "betwenged" (Anglo-Saxon *thwæng*, a charm, or phylactery).

Quitting the zone of cattle-grazing country we may now turn to Nidderdale proper. For the first six miles from Great Whernside the valley takes an easterly course, and both sides are marked by lines of fine escarpment—*à propos* of which it may be observed that this kind of scenery, terrace rising above terrace, which has been so faithfully depicted by Turner, is peculiar to the valleys of the Pennine chain, not only as regards England, but Europe, as neither Norway, the Hartz, nor Switzerland show anything of the kind. To return, however, below this the valley turns to the south, after which only the eastern side continues to be steep. The margin of each terrace is frequently marked by a line of wood, but the slopes and terraces are grazing land. Nearly all the enclosed land on the sides of the dale as high as Woodale, 1000 feet, has been ploughed. It was ploughed straight up and down. No doubt this was necessary, as the slopes are so steep that heavy showers would wash away the soil.

Agriculture has never been a complete success in the dale, and within these twenty years the last of the ploughed land in the dale north of Pateley Bridge has been "swathed." Several late harvests, and some never got at all, have the credit, locally, of having contributed to this result; but the true explanation demands a wider view. The dalesmen themselves say that oats often failed, and wheat would not ripen; but that, as oatmeal was almost their only article of food, they and their fathers were obliged to put up with bad crops and imperfect success, as they were too poor to fetch oatmeal from the better districts. Though from such names as "Rye Close" one would infer that rye had once been cultivated in the dale, there has been none grown for the last eighty years, and all the old inhabitants say that they never heard of any being grown. However, in the winter of 1799-1800 wheat bread was very dear, and the inhabitants of Lofthouse fed upon rye bread. Nidderdale is now one large grazing field. Not only are the young shorthorns nursed here, but vast flocks of sheep are reared on the moors. "Sheep-gates," or the right to turn sheep on to the moors, are let in specified numbers

with each farm, and now it is difficult to get "gates," though thirty years ago there were not sheep enough in the dale to stock the moors. At that time they were all Scotch wethers, now there is not a Scotch wether in the dale. They are all Scotch ewes for breeding, and first-rate Leicester tups, called in the dale "mugs." The result is a sheep known as the "half-bred," with plenty of wool and mutton—commodities largely in demand in the manufacturing districts of Leeds and Bradford. All the spring and summer the sheep run on the moors, each farmer turning out as many sheep as he has "gates" for. In November the farmers near the dale-head sent their sheep down to winter in Haverah Park. Two or three flocks are joined together under the charge of one man, who drives them down and remains with them all the winter, and brings them back on the approach of spring, late in March. They graze on the ling in Haverah Park, or on the sweet land that has been formerly ploughed and again "swathed." All the sheep, however, do not go down. The fields in the upper part of the dale in winter are full of sheep that have been brought down from the high moors. Though these undulating fields, with their ridges and hollows, are admirably adapted for wintering sheep, they can only accommodate a certain number; many die in cold nights, when they contract a disease known as "blackwater."

In the spring the sheep feed greedily on the flowers of the moor-silk (cotton-grass), or, as it is termed in the dale, "Moss-crops and cutthroats." Many hundreds are lost on the moor during the summer by casualties, such as falling into holes in the peat, by getting entangled in the heather, by getting bogged, and sometimes by getting drowned. In times of snow, from their habit of sheltering in the hollows, sheep often become buried in the drift. When this is the case a good dog will "set" them, and, if his master is there, he will recover the sheep; but, what seems most strange, however good the dog may be, if he is alone he will be certain to worry the sheep. None of the dogs on these moors are to be trusted when they go by themselves, as they are all—the best of them—apt to turn on the sheep. The dogs on these moors do not attain to the same perfection as they do in Scotland, probably because the runs are smaller; but many dogs are sent up to be trained here.

The sheep dogs in Nidderdale are referable to four distinct varieties. One, a thin long-bodied dog, smooth-haired, black and

tan, long sharp head, long tail, sometimes tall; very strong, swift, and clever. A second kind is a smaller dog, smooth silver-grey, with dark grey blotches; always wall-eyed, light eye in lighter patch; bark snappish; barks in a skulking way with its tail between its legs; cowardly. A third kind, handsomer than the other two, and generally larger, is a long-haired shaggy dog, with a mass of long hair about the neck; colour black and white, being black over back and sides; has a white ring round his neck (whence he is generally called "Ring"); ears sharp, short, erect; face short, triangular; tail hairy. The fourth type is a noble-looking dog, rough-haired, terrier like, large; colour dark slaty blue above, light ochreous brown below; tan legs; face hairy; ears small, partly erect, then drooping; tail large, dark above, light under; bark loud—a good honest announcement of the presence of a stranger. Though there are some few dogs that do not fall under any of these types, by far the larger number of the sheep dogs in Nidderdale do; and though the points of difference may appear to be trifling, they are extremely characteristic and distinctive. A great many of those dogs are imported from Scotland, a few from Craven, and elsewhere.

The following are some of the very old dog's names in the dale:—Craft, Rake, Gade, Flora, Gess, Bute, Luce, Fleet, Shep, Ring, Tossel, Glan, Roy, Yarrow, and Hoov. Some of these are eminently suggestive of high antiquity. "Rake" has a Scandinavian origin, *Rakki* being the Old Norsk for a dog. Sheep are said to "rake out" when they form into a line on being first disturbed by the shepherd, and the sheep-tracks which they make walking single file are called "sheep-rakes." Danish *Række* means a "row." So that we may safely conclude that the name of "Rake" is at least 1000 years old in the dale. Similarly "Hoov" is the Welsh *Hwv* and the Anglo-Saxon *Hóf*, a hood (pronounced *Hoov*), and was probably given as a name to a dog in allusion to the shape of the hair on the head, or to its colour, presenting the appearance of a hood. The word "Hove" (a hood) was still in use in the time of Chaucer, and is, in fact, used by him in the 'Canterbury Tales':—

" And some deal set his hove."—V. 3909.

The name "Hoov" may therefore be 1300 years old in the dale.

It is probable that we are more dependent upon animal food than we used to be. In their early days the present generation

of dalesmen fed almost exclusively upon oatmeal; either as "hasty pudding," that is, boiled smooth and eaten while hot with milk or treacle; or "lumpy," that is, boiled quickly and not thoroughly stirred; or else in one of the three kinds of cake which they call "fermented," viz., "riddle cake," "held-on cake," or "turn-down cake"; or of a fourth kind called "clap cake." They also made "tiffany cakes" of wheaten flour, which was separated from the bran by being worked through a hair-sieve = *tiffany*, or *temse* (*tamis*). The dalesmen then lived upon the agricultural produce of their land; but in some respects the district of Nidderdale proper differs from the surrounding country.

In Nidderdale much of the upper part of the dale consists of property farmed by the landlords. There is no trace of any other state of things having existed in Nidderdale than that of occupation by individual landowners. But in Wharfedale, Coverdale, Wensleydale, and on the slopes of the hills to the east of Nidderdale, the country is covered with little step-like terraces called "ranes." The sides of the limestone slopes of Wharfedale are covered with them, each being twenty or thirty or more yards long and two or three yards wide, and though they almost always there run horizontally, yet occasionally they lie up and down. These "ranes" lay on land which belonged to the village communities of the dale, and each man in the village had one. One man held a "rane" for three years, when he exchanged for another. This system was in full working order down to the time of the grandfathers of the present generation of men about fifty years old. With the decline of agriculture and the increase of grazing farming, consequent upon the departure of manufacturing, power to enclose was applied for, under the Enclosure Act [6 and 7 William IV., cap. 115], 1836, which gave power to enclose, without a special Act, "open and common arable and pasture lands, and lands commonable during part of the year only, by Commissioners with consent of two-thirds in number and value of proprietors, or, without Commissioners, with consent of seven-eighths in number and value." Long stone fences were built, and the "ranes" remained as the monuments of a bygone age. This was followed by a rapid depopulation of the dales. The stream of emigration set in to the great manufacturing towns of Leeds and Bradford; so that the population of the dales is not now one-third of what it was early in the century.

The absence of "ranes" in Nidderdale is not the only distinctive feature that isolates it from the surrounding country. Though woolcombing was the staple trade till very recent years of Masham, West Burton, and Aysgarth, in Wensleydale, there never were any wool-combers in Nidderdale. Weaving and spinning "line" (flax) employed women till about forty years ago. They made sheets, huckaback table-cloths, and towels, many of which are still in use. At Ramsgill, the birthplace of Eugene Aram, they wove cotton with a machine they called "leām." A man came from Hebden, in Wharfedale, bringing them the raw material, and took back what they had woven. He paid them for their work, and left them as much cotton as he thought they could finish before his next visit. "Garn" is still spun in the dale for knitting stockings; but all signs of manufacturing activity has long since been absorbed by the great centres, and disappeared from the dales.

The absence of ranes and of the art of woolcombing in Nidderdale are only two of many points of difference that lie between it and the neighbouring dales, and the country to the south and east.

Nidderdale lies in the ancient district of Kymry-land, and the evidence of names of places shows that the country immediately to the south of it, and east of Leeds, was well populated by Celts, but the Celts never made any settlement in Nidderdale. Only the most eminent hills on the confines of the dale bear Celtic names. The dale was first populated by the Angles, who entered England, chiefly on the north and east, about A. D. 559, under Ella. They appear to have taken possession of the dale, at least as far as regards its upper half. The interior slopes of the hills, the villages, farms, pastures, sheds, one wood, the springs, tributary streams, and the main river itself, bear generally Anglo-Saxon names. Some of these names are too remarkable to be passed over without mention. Thus "Raydale Knotts" is the name of the interior side of Little Whernside; "Thorpe" or "Thrope," and "Stæn," villages; "Limley" (lime-field) being situated upon the narrow strip of limestone in the bottom of the dale, a farm; "Tiedera Wood," *tiedera* being a pure Anglo-Saxon adjective meaning "thin," most descriptive of the thin hanger of birches upon a steep cliff of limestone to which the name applies; while such names as "Wising (*wisung*, guiding)

sike," "*Haga sike*" (hedge or fence, *i. e.*, boundary), "*Twisling*" (*twislung*, tributary, adj.); "*Thornit*" (*thorniht*, thorny, or abounding in thorn-bushes); "*Mere Dike*" (*meera*, a boundary, being the boundary between Stonebeckup and Fountains Earth) applied to streams, as well as "*Héaning*" to fields (Anglo-Saxon *héan*, high; *ing*, field), give but a faint idea of the extent to which the Angles stamped their image upon the higher parts of the dale during the three centuries of their possession of it before the Danish invasion.

About four miles from its source the Nidd sinks into its limestone bed, and for two miles takes a subterranean course,—like the Mole, in Surrey, which does the same between Dorking and Leatherhead, and the Churn in Gloucestershire. It would have been strange if this rare phenomenon had escaped the notice of the dwellers in the dale, to which it gives a distinctive character. Accordingly, we find the Anglo-Saxon word *Nider*, *nyder*, meaning "down," "below," given, in allusion to this descent and subterranean course, as a name to the river, and the A. S. word *gécotend*, the "down-pouring" or "channel," to the artery through which the water flows. This is now called "Gooden Pot" or Goydin Pot, which latter word may have a different derivation. The modern pronunciation of "Nidderdale" is as nearly "Nitherdil" and "Netherdil" as it can be written in modern English, but the modern name of the river is Nidd. This is, doubtless, one of the modifications introduced by the Dano-Norwegian invaders on their settlement in the dale three centuries later. "Towards 867 an organised expedition of Norsemen under Ingvar and Ubba, two of their kings, landed in Northumbria, in which district, in the beginning of Alfred's reign, or about 872, Halfdene rewarded his followers with grants of land. The settlement was something like the Norman Conquest two hundred years later, and its extent may be gathered from the fact that in the four counties of Yorkshire, Lincolnshire, Cumberland, and Westmoreland, there are nearly one thousand places which have Dana-Norwegian names against less than four hundred in all the rest of England."—Pearson's 'Early and Middle Ages,' ed. 1861, p. 107; Worsaae's 'Danes in England,' p. 71. If the names of farms and physical features were taken into account, this number would be greatly extended. Among other places the Danes settled in Nidderdale, and called the river, not *Nider*, but

Nid, the name which, from its greater simplicity, ultimately prevailed.

Now Nid is the name of a river which flows through the town of Throndhjem, in Norway, and gives the names of Nídar-óss to a famous old town at its mouth, Nídar being the Norwegian genitive of Níd; and óss, mouth. Similarly "Nidderdale" may be Norsk, Nidar-dalr, the dale of the Níd, but the earlier explanation seems preferable, considering the three centuries' occupation of the Angles. However this may be, the modern name of Nid certainly seems to be Norwegian or Danish.

From Nidderdale, Great Whernside and Little Whernside appear as two distinct hills, two miles and a half distant from each other. The name of Whernside is itself of doubtful origin (A. S. *cwærn*, O. N. *kvern*, a quern; and A. S. *sid*, O. N. *sida*, side; the first, given by A. S., seems best), but this much about it is certain, that the whole hill takes its name from a part of it, *viz.* the Wharfedale side, which is so called. Here are quarries from which the stone may have been dug to make querns. The Nidderdale side, however, is called Blackfell. In other words, the hill seen from Wharfedale is called "Whernside," and from Nidderdale "Blackfell." Similarly the slope of Little Whernside in Nidderdale is called "Raydale Knotts," and that in Coverdale "Cowside"—an obvious corruption of "Coverside"—while it borrows its general name from the larger hill. Whernside is pronounced "Whainsid," which favours the A. S. origin. "Quernside" has been changed into Whernside, in the same way as "Quarrel"—*i. e.*, Quarry—has been softened into "Wharrel" in the name Wharrel Crag on the moors east of Coverdale.

That tract of moor included between the Nidd and How Stean Beck bears the names of "In Moor" and "Middlesmoor" (Niddel mór). I regard "Middlesmoor" as the older and A. S. name, and "In Moor" as Old Norsk. The summit of this forms a conspicuous hill, 1488 feet in altitude, which now bears the name of "Rain Stang." "Rane-stang-en" is the name of a mountain in Norway on the watershed between Valdres and Hallingdal. "Rani" is the old Norsk for a hog's snout, a hog-shaped hill, or "hog's-back," and "stang" the Danish for a pole or post. The name "stang" occurs many times on hills in Yorkshire, as Kettlestang Moor and Stang Brae, near Carlesmoor in the Laver basin, and "Stanghow" (Cleveland). Besides "Rainstang" to its summit, the

Danes gave various names to other parts of "Middlesmoor," of which they took possession: *e. g.*, "Armathwaite" (O.N. *arma*, gen. plur. of *armar*, an arm; and *thveit*, detached piece of land, Armathwaite being situated near the junction of two "arms" which unite to form How Stean Beck, a tributary of the Nidd), while Middlesmoor was eventually retained only as the name of the village. Other Norsk names of hills and eminences are "Bull brae" (Icel. *bula*, to tear asunder; Norsk *brae*, hillside), the name of a part of the north side of the dale from which there has been a large slip, "Haden Carr" near the dale head, a plateau 1500 feet ending in a steep escarpment (O.N. *hæd*, hill, height; *Kjarr*, bog covered with brushwood), "Jordan Moss" (Dan. *jord*, earth, peat; *en*, the; *mos*, moss, the peat-bog), the name of a peat-bog on Lofthouse Moor; "Blue Burnings," the name of a steep hillside above Lofthouse (O.N. *bláberne*, the blæberries), formerly a wood famous for bilberries; also "Blubberhouse" (Blåber-hus) in Washburndale; "Trappen Hill," the steepest part of the hill-road that runs up by Blue Burnings (Dan. *trappe*, staircase, *en*, the—*trappen*, the staircase). Before the road was made it is probable that steps were here cut in the soil; they are common enough at the present day. "Arna Nab" (O.N. *arna*, gen. plur. of *orn*, an eagle; Nab, Dan. *næb*, projecting point of a hill, eagle's point); "Arnagill," a picturesque rocky gill at the southern extremity of the Colsterdale basin. "Brown Ridge" (O.N. *brún*, brow of a hill), the northern watershed ridge of Nidderdale, 1500 feet; "Acora Scar" (O.N. *akr*, arable land; as opposed to *engr*, grass land), and many others.

Another physical feature of great interest that bears an old Norsk name is "Beggarmote Scar," a steep cliff in limestone at the angle of the Nidd at which it first sinks in volume into the ground at a place called "Manchester Holes." Beggarmote (pronounced "Beckermort") is O.N. *bekkjar*, gen. sing. of *bekkr*, beck, and *mót*, meeting; but it does not mean a meeting of the waters, for there is no meeting of any waters. It simply means a "juncture," and has the same sense as in *alda-mót*, the end and beginning of two centuries; *missera-mót*, the meeting, juncture of the seasons, where one ends the other begins; so *bekkjar-mót*, means the point at which the river on the surface ends, and that below ground begins. Beggarmote Scar is opposite Tiedera Wood, which is on a similar limestone cliff, but bears an Anglian name. The true explanation of the meaning of this interesting

name shows how necessary it is to visit a place and see the nature of the spot to which a name is given. "Beggarmote," though correctly derived, has previously been wrongly explained, as shown above. "Manchester" refers to the same event(?); It. *manchézza*, loss, defect.

It is interesting to note the collection of *Danish* names as opposed to old Norsk, on the east side of the Nidd near Loft-house, which is itself Danish. This probably indicates that the settlers there were of a later date than the original Scandinavian invaders who settled on the west side.

Thus far attention has been drawn to the names of physical features, but there are one or two more most interesting points connected with names of places that should on no account be passed over without mention. It has already been shown that most of the streams in the upper part of the dale bear Anglian names. For the highest eight miles of the dale, or as far down as Stæn Beck, there is not one Danish name applied to a stream. "Buskar Beck," a tributary of Stean Beck, is, however, Dan. *busker*, bushes, nom. plu. of *busk*, a bush.

In the highest eight miles of Nidderdale, above Stean Beck, there are forty-two streams, including branch tributaries, of which twenty-seven are named. Of these twenty-seven six retain their original Anglian names unchanged, as "Stand Sike," "Hagga Sike," "Madding Sike," "Mere Dike"; and twenty-one do so with the interpolation of the word "Gill," as in "Skitter Gill Dike," "Wising Gill Sike," "Twisling Gill," "Thornit Gill." "Gill" (O.N. *Gil*, a deep narrow glen with a stream at the bottom), being the name, not of the stream, but of the narrow valley which contains it. The English, who came from the Low Countries in which *rivers* are the most strongly marked physical lines, were careful to name their rivers and streams, the watershed ridges being low, flat, and ill-defined; but the Norseman, who dwelt in a land where the watershed ridges from the great physical barriers, or lines of *division*, called the included area *dalr*, a dale, or *division* (Goth. *dalei*, dale, *dailjan*, to divide; A.S. *dæl*, a division, a dell; O.N. *deild*, a division; Germ. *thal*, dale, *theil*, a division; Gr. *δίο*), making the name of the river subordinate.

For this reason a dale frequently bears one name and the river another, as Sjøetersdal in Norway, river Otter; Wensley Dale in Yorkshire, river Ure; Colsterdale, Yorkshire, river Burn. Therefore, when the Norseman found himself in the Yorkshire

hills, he at once applied the cognomen of "gill" and "dale" to the smaller and larger valleys, which the English had been content to know by the name of the river or stream.

There is one more point worthy of mention. The English, or Angles, settled in the whole dale; whereas the Norseman, and, at a later date, the Dane, obtained a footing here and there. Thus "Angram," at the Dale head, is a Norwegian settlement (O. N. *Angrum*, dat. plu. of *Angr*, either a man's name or "the bay: these datives, of which we have no English equivalent, have the force of "in" the place). Here we have the words "thwaite," and "laith" or "lathe," for shed (O. N. *hlada*, a barn):—

"Why ne had thou put the capel in the lathe."

CHAUCER, '*Canterbury Tales*,' v. 4086.

On the next farm, Lodge, an Anglian settlement, all the sheds are called "barns," an Anglo-Saxon word which prevails all the way down the valley to Stean Beck, at which stream we again find the word "laith." At Stean the word "shipn" is used (A. S. *scypen*, a stall, stable):—

"The shepen burning with the blackë smoke."

CHAUCER, '*Canterbury Tales*,' v. 2002.

The words "with" (O. N. *vidr*, a wood) and "royd" (O. N. *rjódr*, a clearing in a wood), so common south of the Wharfe and to the east of Nidderdale, do not occur in the dale. "Firth," a wood, is common over the watershed to the east, but does not occur in the upper parts of the dale. An extensive swamp on the moors near Meughar Hill is called "Great Wham," 1750 feet (O. N. *hvammr*, a swamp). It possesses a rich flora; also "Sand-with Wham," on the moors to the east of Nidderdale. The branch of a stream is called the "grain" or "granes" (on the moors), as "Agill Granes" (O. N. *grein*, Dan. *green*, a branch). One of the oaks below the High Scar, Bak'stone Gill, being split upwards as far as the branches by a landslip upon the edge of which it grew, was said to be "roven up to the grain." This point is also called the "brawn."

The pronunciation of the old French word "pasture" (pastoor) is well preserved in the upper part of the dale, while the preservation of the names of "Haver Close" (Danish *haver*, oats, French *clos*) and "Hasel Close"; as well as of *arran*, a spider (old French *araigne*); "Heronshaw," "Heronsew" (old French *Heronceau*, a Heron); "Fromarty" (old French *fromentée*, sodden

wheat), &c., indicates that the Norman invasion touched Nidderdale lightly. Fountains Abbey had granges in it.

Nidderdale and its moors have formerly been covered by an extensive forest. Many trees lie buried in the peat upon the moors. In the thousands of sections made by little water-courses the birch appears almost everywhere predominant. Hazel, "sealh" (willow), thorn, oaks, &c., also occur, but the birch must have formed a thick and almost universal forest by itself, such as may be seen on the west coast of Norway at the present day. There are many oaks in the peat-bogs between Blayshaw Gill and Brown Rigg, 1000 to 1250 feet, easterly aspect, exposed; and a very large oak, thirty feet long, was dug up at Biggin Grange, Kex Moor (550 feet). In Sykes Moss most of the buried trees are sealhs, oaks, and birches. The birch is easily recognised by preserving its bark so completely, and an old sealh is known by its red wood. The wood of a young sealh is white.

The birch and thorn covered the upper part of the sides of the dale, what the Angles called the "Edge," while in the bottom of the dale there flourished the sycamore, ash, holly, hazel, alder, bullace, elder, wych elm, "heckberry" (bird-cherry), &c.; the last especially in the neighbourhood of Lodge, near the dale head. There is now a fine avenue of planes (sycamores) at Woodale, 1000 feet, with heckberry, common ash, and alder, with *Petasites vulgaris* along the river bank. At Rough Close, 925 feet, there are hazel, holly, ash, sycamore, bullace; on Bekkrmót Scar, 725 to 900 feet, there are ash, hazel, holly, bullace, thorn, the ash being the commonest. All the large trees on the Scar are ash, with a strong undergrowth of hazel. All along under Thwaite House nearly all the trees are ash, with the remains of hazel undergrowth, and a few fine "hollins" (hollies). On Boysoak Scar, 700 to 750 feet, there are ash, alder (at bottom), holm, ivy, and elder; and along the river bank south of Thorpe House, 600 to 650 feet, there are ash, alder, hazel, heckberry, plum (sloe). In the same field there is a remarkable old birch, with very small leaves, not pendulous. Though there are now hardly any beeches to be seen in the dale, I am told by the old people that they formerly abounded, but have been gradually all felled. Bekkrmót Scar and Boysoak Scar are limestone, but all the rest of the dale is sandstone and shale, or the covering of drift clay and gravel that lies upon them. With these may be compared the limestone slopes of Wharfedale. A little above Netherside, on a steep slope below

the road, is a natural wood of birches. At the top of the sides of the valley for miles are remains of extensive thorn scrub. Lower down the sides and along the bottoms, many sycamores. The valley has, however, been much cleared of trees by agriculturists.

Birch and "eller" (alder, Dan. *eller*) were formerly extensively exported from the dale to supply the bobbin-makers, but this trade has nearly ceased. Some years ago, when the "scrogs" (Dan. *skrog*, trunk, stump) were cleared off Thorpe Edge to make room for a large plantation of larches, known as "Thorpe Plantation," a great deal of charcoal was burnt, and was sent to Masham to heat the combs of the woolcarders: this was not commonly practised, however, in the dale. Blue Burnings Wood, which formerly existed near the spot (1000 to 1200 feet) consisted of birch and hazel scrub. Blæberries abounded there: this being a most capricious plant in the matter of ripening its fruit, it may be well to state that the site is a steep hillside running north-west and south-east, and facing south-west, at the elevation given, the slope of the ground being 1 in 44, or an angle of fourteen degrees. Most part has been ploughed within the last seventeen years. Turnips and potatoes succeeded there; oats would hardly ripen, sometimes not at all. Blue Burnings now belongs to different proprietors; part is glebe land. Before the enclosure the same proprietors ran sheep on it, each having so many gates.

The peat on the moors, viewed broadly, is now undergoing a process of destruction. Except in the "Whams" the conditions for its formation do not exist. In summer, on the higher ranges, the peat becomes very dry and dust-like, when it is swept away by the strong winds, all along the lines of the dry beds of what are, in the autumn and winter, watercourses. This process is best seen in the ascent of Great Whernside from the south-east, where acres together of bare rock have been thus denuded. The villages have their common land on the moors from which the inhabitants may fetch peat. Middles Moor has one hundred acres of peat common for the village. The top spit of the peat is cut with a spade with a long bent handle, called the flaying (pronounced *fleäing*) spade, into pieces sometimes a yard long and eight or ten inches wide. These strips are called "flouts." They are not used for burning when "peats" can be got, but blacksmiths use them for heating the tires of wheels. For this purpose they are better when cut from sandy ground, as the sand makes them grow hotter.

In the process of gathering peat they first cut slices the shape of a thin brick, about eight inches or so long, in May. These they call "peats." The peats are laid to dry and harden on the moor a few hundred paces from the place where they are cut. After about a fortnight the cutters "set" them, which is standing three pieces together, one piece on its side edge, slightly leaning over towards two others resting endwise against it. After another fortnight they "hut" them, which is setting six or eight more peats round these, and laying two or three flat on the top to shoot the rain off. After a time, sometimes as much as a month more, they pile them into stacks, which are called "ruckles." Of course all this has to be done in the dry weather. If a person puts off getting his peat till late in the season, he runs risk of not having any for the following winter, and indeed this sometimes happens. It is useless to try and get them when the wet season has once set in. The process of gathering his peats occupies a man for a period not complete under about two months.

To the botanist the district of which Nidderdale forms a part possesses a fourfold interest. While its higher parts ascend into the arctic region of Watson, its lower portions lie far down in the agrarian zone. The line marking the upper limit of grain crops divides the district into two parts, in the higher of which many northern types occur, while in the lower we have representatives of the Midland and Southern English, and of the Germanic types of distribution. The district lies upon the border-land of several provinces, both as regards zones of elevation and areas of distribution.

The Germanic is represented by the rare *Primula elatior*, or oxlip, which ranges up to 750 feet east of the Nidd, but up to 900 feet or more in Wharfedale; and in Wharfedale by the still rarer and more beautiful lily of the valley, *Convallaria majalis*, which grows in the woods near Netherside in large beds like garlic, and at Arncliffe.

The Southern English type is represented by the daffodil (here a rare plant), *Narcissus pseudo-narcissus* (which grows at Azerley, at 300 feet), *Colchicum autumnale* (in meadows by the Ure near Tanfield, 200 feet), *Euonymus europæus*, the spindle tree (one bush by the Ure near Low Mains, in Masham parish, 250 feet, exceedingly rare); while to the British English type, or those which, though occurring throughout Britain, are yet more plentiful in the southern counties, belong herb-paris, *Paris quadrifolia*

(wood near Azerley, 250 feet, very rare), and *Gentiana amarella* (widely scattered, but rare, and exceedingly pretty with its pale rose-coloured flowers).

The Midland, or Intermediate type of distribution, is represented by the nearly extinct *Cypripedium calceolus*, or lady's slipper, which still grows at one or two favoured stations in Wharfedale, very properly "not for publication"; and *Primula farinosa*, one of the most beautiful of plants. Its flowers are a pale lilac-purple, with a yellow eye; the leaves are mealy pale green above, and silvery beneath. Its habitats "stream-bogs" or bogs not stagnant.

The British Intermediate type, or those which, though occurring throughout Britain, are most plentiful in the Midland district, is represented by the cranberry, *Vaccinium oxycoccos*, a fastidious fruiter.

The Scottish type, or those which range as far south as the North Midland districts, is represented by *Trollius europæus*, the globe-flower, which ascends to 1400 feet, on Greenhow Hill; it likes shallow valleys by running streams. *Prunus padus*, the heckberry (Danish *hekke*, hedge; *bær*, berry), or bird-cherry, which is common in the upper part of Nidderdale, from 800 to 1200 feet. Towards the end of May the long white racemes of clustering flowers that adorn this mountain-loving species add a strange and characteristic beauty to the pleasing wildness of these subalpine dales. The London-pride, *Saxifraga umbrosa*, grows wild on the limestone of Greenhow Hill, at 1400 feet, where it carpets for acres the gently sloping grass fields on the northern side. There is no reason for doubting that this is as true a British species as the very grass that grows with it. Who, it may be asked, would take the trouble to carry it up to a wild Yorkshire hill and plant acres of it 1400 feet above sea-level? Surely such an enterprising person would have chosen a locality better calculated to bring him some reward for his trouble. "Mr. Tatham," says Mr. Watson, in his 'Cybele Britannica,' "deemed it wild in Heseltine Gill, West Yorkshire; and according to Mr. Brand, it grows 'On Craig-y-barns, a hill to the northward of the Park at Dunkeld, covering acres, and in some places to the exclusion of everything else, forming the entire turf. But for the occurrence of *Hypericum calycinum*, and other introduced plants, it would have been considered native.' But

against this fairly given testimony of Mr. Brand there is something more positive than the suggestive counter evidence of *Hypericum calycinum* and its associates. In the 'Correspondence of Sir J. E. Smith' we find a letter from Mr. Winch, expressly stating that the *Saxifraga* was introduced into the woods of Blair Athol by the gardener. Whether his introduction extended as far as Craig-y-barns does not (from memory) appear in the letter." Now a gardener would probably be the very last person to plant it on Craig-y-barns, though he might to adorn ornamental woods; and the natural conclusion is that he introduced it into the woods from Craig-y-barns, its native habitat. *Melampyrum sylvaticum*, whose small deep yellow flower is often the only one to be seen in the woods, is plentiful from Huddersfield northwards. In Nidderdale it is plentiful in the woods near Fell Beck, 600 to 700 feet, sheltered; also at Hag Pits, 500 to 600 feet, sheltered.

The Scottish-British type, or those which, though occurring throughout England, are most plentiful in Scotland, is represented by *Pyrola minor*, lesser wintergreen, which grows in leaf-mould in Hackfall, 300 feet, a noble wooded gorge through which the Ure flows between Masham and Tanfield. *Parnassia palustris*, grass of Parnassus, and *Pinguicula vulgaris*, the butterwort, adorn many of the wet bogs generated by springs on the hillsides. The green-veined wax-like flowers of the former, and the noble appearance of the plant, call forth the admiration of the botanist who for the first time lights unexpectedly upon them in their native hillside bog; and the recollection of the inexpressible pleasure felt on first finding *Parnassia palustris*, *Pinguicula vulgaris*, *Drosera rotundifolia*, *Narthecium ossifragum*, *Rubus chamæmorus*, *Myrica Gale*, *Trollius europæus*, *Saxifraga umbrosa*, *Botrychium lunaria*, *Ophioglossum vulgatum*, and many other rare and beautiful plants, has remained fresh in the memory, affording a never-failing source of pleasure through many after years of the rough battle of life. The young botanist who yet has before him the pleasurable emotions attendant upon the discovery of some new or rare plant for the first time may well be envied that rapture. *Botrychium lunaria* is rare. It grows in grass fields, and is difficult to see. It grows in Nidderdale near Clark's Carr Wood, at 600 feet, sheltered.

The Scottish Highland type, or those which, though occurring in the northern counties of England and in Scotland, are yet

limited to the mountains, is represented by *Empetrum nigrum*, the crowberry, which grows sparsely among the ling on the moors up to 1800 feet; *Vaccinium Vitis-idaea*, cowberry; *Arctostaphylos Uva-ursi*, the bear-berry, which is very rare on these moors, occurs on Great Wham, 1750 feet, and on Little Whernside; *Rubus chamæmorus*, the smallest tree, the cloudberry, with a beautiful white blossom, is scarcely six inches high, and grows sparsely on the high moors, but is very local in its distribution on them; *Oxyria reniformis* is common on moorside pastures and streams; while *Trientalis europæa* is exceedingly rare. This last occurs also on the moors of Cleveland.

The British type, or those that are fairly equally distributed throughout this island, is represented by many rare and interesting plants. *Drosera rotundifolia*, which is found on the peat on the moors in abundance; the juniper, which is very rare, but of which a few bushes are preserved in sheltered gills on the borders of the moors, as in Lul Beck, at 1000 feet; the asphodel, which is very rare, grows under Brimham Rocks, at 850 feet, and on Conistone Moor, about 1750 feet: the golden yellow flowers of this exquisite little plant are some of the most beautiful things in nature. *Menyanthes*, bogbean, fairly common in bogs; *Myrica Gale*, not common, moorland bogs; *Calluna vulgaris*, the ling, characterises the moors, but does not ascend above 1800 feet, often replaced by green grassy moors; *Erica tetralix* and *cinerea* occur among the ling; *Gymnadenia conopsea*, sparsely, up to 1200 feet, in grass fields; *Corylus avellana*, in the valleys, up to 1200 feet; *Vaccinium myrtillus*, local, but not uncommon, especially in moorside woods and in sheltered damp places on the moors on which the sun shines, when it fruits best; *Draba verna*, scarce, Pateley Bridge, 500 feet, and Galphay, 400 feet; *Ophioglossum vulgatum*, exceedingly common in places, occurs right up the dale to Lodge, 1250 feet, in grass fields; *Digitalis purpurea*, sparsely; *Mercurialis perennis*, less plentiful than south of Wharfe, where it is most common; *Primula vulgaris*, 1800 feet, on Pen-y-Ghent, in flower May 7, 1871, very dwarf; *Cochlearia officinalis*, carrier pasture, near Kettlewell, grassy boggy moor, 1600 feet, north-east aspect, same day; *Adoxa moschatellina* and *Asplenium viride*, on north slope of Pen-y-Ghent, 2000 feet, both very dwarf.

(To be continued.)

ORNITHOLOGICAL NOTES FROM NORTH LINCOLNSHIRE.

By JOHN CORDEAUX.

THE extraordinary cold and backwardness of the spring of 1879 is certainly without a parallel during the last quarter of a century. A winter of extreme severity prolonged far into what ought to have been a spring, and culminating in a wet and cold summer, makes it almost an anomaly to write of spring, which season this year might almost be erased from the calendar. All this most ungenial weather has had the effect of greatly retarding and throwing back vegetation far beyond the ordinary period, and the observations now regularly taken at various stations in the kingdom, in connection with meteorological phenomena, on the foliation of trees and the first blooming of certain flowers, will, when brought together, probably result in showing that it is the latest and most ungenial season ever recorded in the British Isles. This will be best illustrated by a reference to the appended comparative list, showing the first blooming of certain familiar plants in North Lincolnshire in the spring of 1878 and that of 1879:—

	1878.	1879.
Coltsfoot, <i>Tussilago farfara</i>	Feb. 18.	March 19.
Lesser Celandine, <i>Ranunculus ficaria</i>	Feb. 24.	March 18.
Marsh Marigold, <i>Caltha palustris</i>	Feb. 24.	March 20.
Wood Anemone, <i>Anemone nemorosa</i>	March 16.	April 7.
Cowslip, <i>Primula veris</i>	March 24.	April 28.
Blackthorn, <i>Prunus spinosa</i>	March 31.	May 11.
Herb Robert, <i>Geranium robertianum</i>	May 4.	May 30.
Dutch Clover, <i>Trifolium repens</i>	June 9.	June 21.
Common Mallow, <i>Malva sylvestris</i>	June 10.	June 28.
Black Knapweed, <i>Centaurea nigra</i>	June 22.	July 14.
Hawthorn	May 11.	June 9.
Wheat in ear	June 8.	July 12.

As might have been expected, the arrival of our spring migrants has been most erratic, and in many cases prolonged beyond the average period. Consequent upon this and the cold weather, most birds have nested a month behind their time, and then, in a vast number of instances, the first eggs have been addled

and destroyed by cold rains, coupled with an abnormally low and continuous temperature.

Up to this date (the end of July) I have been struck with the general paucity of young birds which have left the nest. This is very marked in the case of the ground-builders, and the numerous instances in which we find nests deserted and eggs spoiled will fully account for the scarcity. The constantly recurring heavy rains have reduced this strong-land district into a swamp of soddened grass and liquid mud. Enormous as was the loss amongst birds in the last severe winter, the survivors have hitherto had a poor chance of recruiting their ranks from the young of the year.

A reference to my note-book shows that from January 20th, and a fortnight later, with biting north-easterly winds and frosts and snow, the only birds to be seen in this bleak and exposed district were Larks and Snow Buntings. By the 3rd February Linnets and Twites appeared, and on the 8th Thrushes were singing, and Rooks had paired and returned to their nesting haunts. From the 16th to the 25th the wind was still N. and N.E., with many heavy snow squalls and sharp frosts. Larks were still packed together in flocks, vast numbers migrating southward, others remaining about the stubble-fields in company with Snow Buntings. At this time large flocks of Lapwings and Golden Plovers returned. On the 28th, the first really warm and spring-like day, with a south wind, there was a regular burst of melody. Blackbirds, Thrushes, Larks, and several other species were singing; and on March 1st the mellow notes of the Golden Plover were general in marsh-land.

During the first fortnight in March I almost daily saw flocks of Tree Sparrows. They used to come regularly to some paddocks near the house to feed on small seeds and refuse from the farmyard, spread on the grass. These flocks may have been migrants going northward, as they were not seen after the middle of the month. In June I found *Passer montanus* nesting in holes in old and decayed pollard willows overhanging a trout stream on the wolds.

There was a single Wheatear on the high wolds on the 19th March. Most common as they are in the early spring in our marshes during the migratory period, it is somewhat curious that this year has been an exception, as I have seen

none.* Later in the season, on the 20th May, a remarkably handsome pair of the large variety† was seen by me on the “beck” side in this parish. They alighted on the highest twigs of a tall ash, a tree so common in this county and generally distributed that it has earned the soubriquet of the “Lincolnshire weed.” This pair of Wheatears seemed very arboreal in their habits, as for the quarter of an hour that I followed them they flew from tree top to tree top without once coming near the ground.

As late as March 21st there were about a score of Snow Buntings on the Humber embankment; this is a very late appearance. Amongst these were several examples in the beautiful pied breeding plumage, a dress we so rarely see them in in England. Well might they linger on our shores, and put off their flight across the storm-swept northern seas; for, from the 22nd to the 25th, came—for the season—four of the coldest days I have ever experienced; east winds and frosts, cakes of ice floating down the big marsh drains, and great icicles on the northern sides of sheds and outbuildings.

The first familiar notes of spring came with the little dark-legged Chiffchaff, on April 2nd. Bleak, bare, and desolate must he have found the tops of the elms, for I note that at this date the buds on the hawthorn were not developed larger than No. 4 shot; last year, at the same time, they were more than in half-leaf. After the Chiffchaff came another burst of mid-winter, with ice on Good Friday morning (April 11th) half an inch in thickness, and on the 12th four inches of snow.

Here the first Swallows were seen on April 22nd. Three were observed from the Tees light-vessel on the 25th, flying in a south-westerly direction. The 23rd brought the Yellow Wagtail. On the 24th Hooded Crows still lingered in the marshes and on the coast, the last of their tribe, cawing disconsolately to the melancholy main—the knowing birds probably aware that there were no birds’ nests ready to harry in the north. This same day the Cuckoo was heard, and Swallows had become numerous. On April 26th a single Cuckoo passed the Tees light-vessel from S.E. to N.W., a moderate S.E. breeze blowing.

* A very competent observer on the Teesmouth light-vessel says that on April 7th he observed a great many Wheatears pass; wind S.S.E., and clear.

+ See Lord Clifton’s remarks on this race or variety in the current number of ‘The Ibis,’ July, 1879, p. 369.

The Tree Pipit has been exceptionally numerous, and is the only one of our arboreal migrants which can be said to be at all plentiful. They arrived about the last week in the month, and their pleasing song has been heard from every copse and wood, both in the low country and over the high wolds.

The first week in May brought a recurrence of winter, with east winds and frozen drains, the weather continuing most severe till after the 10th. On the night of the 9th there was a hard frost, with icicles two to three inches in length on the eaves of buildings. Notwithstanding the excessive cold House Martins were hawking on the beck and other open waters on the 9th. This day five black-breasted Golden Plovers pitched in one of our fields, and a single Swift appeared hawking above some large woodlands on the wolds. Swifts have been most abundant, so much so as to attract attention by their numbers, and I do not think I have ever known them generally hawk at so great a height. The Nightingale was heard on the 12th; they have been quite common in North-east Lincolnshire, also on the opposite side of the Humber in Holderness. A short break of warmer weather on the 13th brought the Sedge Warbler, and on the 14th the Garden Warbler. The Whinchat was seen on the 17th; they have been most scarce, and I have not observed a tithe of the number which visits us in ordinary seasons. Spotted Flycatchers appeared at their old haunts on the 14th; and on the same day Martins commenced laying the foundations of their nests under the eaves.

A great peculiarity of this most untoward season has been the almost entire absence of the flocks of migratory waders from the Humber flats. On April 16th I saw a few Grey Plovers, and a flock of Dunlins, *Tringa variabilis*, estimated to contain from 1500 to 2000. These, with a few Whimbrel about the middle of May, complete my list. The probability is that the wet season having been prolonged so late into the summer our waders when once on the move have gone directly forward to their summer haunts, without making a half-way house of the Lincolnshire coast.

On April 15th and subsequent days a Dipper visited our small stream. It was not wild, and permitted a tolerably near approach. Short of shooting and examining the bird, which I was reluctant to do, I had little doubt of its belonging to the

northern variety known as *Cinclus melanogaster*. On May 27th I saw the Turtle Dove in the next parish; and on the 31st, when riding across the wolds, I had an excellent view of the Great Spotted Woodpecker, a species by no means so scarce in North Lincolnshire as is generally supposed, haunting the large woodlands and old timbered parks. Very large flocks of Brent Geese and Widgeon were observed every day off the mouth of the Tees during March; they had all left before the 28th. From a notice in 'The Field,' it appears the former lingered on the Essex coast till late in May. The only ducks seen by me when cruising on the south and south-east coasts from the Solent to the Humber, in the second week in June, were Common Scoters, the "black ducks" of the fishermen. Terns were seen on the Tees on the 19th April; numerous on May 7th. We took no eggs of the Carrion Crow till after April 14th. My boys took several nests during the Easter holidays, and a young birdnesting friend secured 127 eggs. I mention this to show how numerous the species is in North Lincolnshire, where, as a rule, game is not preserved.

I have paid especial attention to the Starlings this season—if possible, to substantiate the fact of the separation of the young and old during migration. After the young leave the nest they assemble in the marshes in flocks of greater or less extent—from twenty to thirty to several hundreds. Occasionally I have detected an old bird or two; but they appear as often without as accompanied by adults. As a rule, the old birds remain about their old haunts, and, in the majority of cases, nest a second time. During this period the young of the first broods certainly collect together. Mr. Gätke states that hundreds of thousands of young Starlings cross Heligoland in June to the end of July, and like numbers of old birds during October and November, and later; that young and old are thus strictly divided, and migrate at quite distinct periods.

During the last week in July Whimbrel passed overhead, and I also saw a few small flocks in the marshes; with flocks of from ten to twelve young Curlews. The plaintive whistle of the Ring Dotterel came from the fallow land—a sure indication of summer being far advanced. May I never have to write of a more miserable and ungenial one

ORNITHOLOGICAL NOTES FROM ST. LEONARDS.

BY J. H. GURNEY, JUN.

A BUZZARD seen on May 10th was evidently a migrant, making its way in from the sea at a great height. I cannot say of what species it was, but its mode of flight was curious. Having first risen in circles to an immense height, it shot off on a steady descent, which was at such a gentle angle that, without any perceptible movement of the wings, the natural buoyancy of the bird sufficed to carry it almost out of sight. On May 4th I saw four Bartailed Godwits at a little marsh about two miles west of St. Leonards, and two or three hundred yards from the sea—the most attractive place imaginable for tired waders. Two of these birds were in full summer plumage, one was in change, and the other still in winter plumage. They were extremely tame. On the first occasion I got within about thirty yards of them, and going again two days afterwards approached within five yards before they attempted to fly. At this marsh, on May 7th, I saw a Sandpiper, which, from its small size, I have little doubt was a Wood Sandpiper.

I went twice to Winchelsea in search of Terns; but they are not so common there as I had hoped to find them, which I suppose is due to the extensive manufacture of shingle-concrete which is carried on at the adjoining town of Rye. I only saw a pair of the Common Tern; but nearly opposite Camber Castle a very nice colony of Lesser Terns were breeding. I have no doubt at the date of my visit many of them had young, as they were busy fishing and carrying the fish about in their bills after they had caught them. A very pretty manœuvre—which I do not remember witnessing at Blakeney, near Cromer, where there is another colony of these birds—was dropping a fish in the air and catching it again in its descent. While looking for their eggs I stumbled on a couple of Boar-fish, *Capros aper*; they had lost all that beautiful salmon-colour which is so conspicuous in the live fish. This species seems to have been very abundant all along the south coast this spring; several were taken at Hastings. I believe Hastings to be a very good place for anyone who is making a study of fish. During my stay there I saw two Anglers, or “Fishing-frogs,” *Lophius piscatorius*. Twice a fine Grey Mullet was caught off the parade, in a common shrimping-net, which I mention for the singularity of the capture.

On my arrival at Hastings in April, Guillemots, or "Willocks," were very common; but when I left, in June, not one was to be seen. A gentleman, who is very fond of birds, told me that during a part of April there was a constant movement eastward of Guillemots and allied species, while Scoters also, I believe, joined in the same movement. Mr. Bates, the taxidermist, of Eastbourne, informs me that no birds of the Guillemot tribe breed at Beechy Head now. He saw seven Spotted Redshanks at Eastbourne on May 4th, the same day that I saw the Godwits. One which was shot was described as being in magnificent summer plumage. The legs, Mr. Bates informs me, were entirely black; no red colour at all in them. The May passage of waders on the south coast lasts but a short time; by the 20th it seems over. Many other migratory birds, if not detected by the observer on the day they are passing, are not seen at all. For three days Whinchats were abundant at Bexhill, after which they disappeared. At the same place, for a few days, there were numbers of beautiful Yellow Wagtails; but the majority made no stay. The Pied Flycatcher, as I learn from Mr. Bates, occurred twice at Eastbourne—on the 5th and 20th of May; and on the 19th a female Black Redstart was identified. I learn from the same source that a white Red-necked Grebe, almost an albino, was obtained off Beachy Head.

Before leaving St. Leonards I paid a visit to the fine old red-brick Castle of Hurstmonceaux, of the time of Henry VI. Its ivy-mantled walls are very fastnesses for the Owl and the Jackdaw. There were scores of egg-shells of the latter birds in its side towers. The Stock Dove, too, as might be expected, nests in its walls. A short walk across Mr. Curteis's park took us to the Heronry, a goodly colony of nearly fifty nests, placed, with a few exceptions, upon oak trees, the exceptions being beech. The numerous rabbits of the vicinity are laid under contribution by the Herons; we found two young ones under the trees, together with a mole, a rat, and a perch. Very little comes amiss to these voracious birds. They formerly nested close to the house; but, as often happens when disturbed by Rooks, they deserted the spot, and migrated to a field opposite.

The Cuckoo is a bird which seems to be increasing in England. It is exceedingly common at St. Leonards and Hastings. In one of my walks I put up a Cuckoo in a meadow, which, as it flew away, was pursued and mobbed by two Titlarks. On going to the

spot, a few yards from where it rose, I found a nest with two eggs, which were certainly those of the Sky Lark; one was sucked, the other was sound. Had the Cuckoo done this? I suspect so.* A week after I went again to look; the sucked and broken egg was gone, and three others, all sound, were there. If the Cuckoo was the culprit, it was probably frightened by me, and had not been again.

On May 31st I saw a Blue Tit's nest in a lamp-post, and was informed the same pair had nested there for three years. The entrance was at the top of the hollow iron post, full under the light of the gas. The persistency with which the Starlings drop their eggs, at Bexhill, on the edge of the cliffs where they breed, is very remarkable. I found nearly a dozen on different occasions, and all near the same spot. All but one were broken and yelkless, which I imagine must be the work of mice, as I hardly think the old Starlings would do it. The first Lapwing's eggs noted were on March 31st. Great numbers are collected in the neighbourhood of Hastings, and sold by the fishmongers and poulterers; yet, although so many were taken, the price never dropped below $3\frac{1}{2}d$. Fresh eggs were taken up to the first week in June. A nest of four eggs taken on June 3rd contained two fresh and two slightly sat upon. At this time fully-developed young Pied Wagtails were about, with tails as long as their parents, from which they could only be distinguished by colour.

There are some birds whose absence from St. Leonards is remarkable. I never saw the Redstart (*cf.* Knox, 'Orn. Ramb. in Sussex,' p. 192) in my walks, though keeping a particular look out for it; and I never heard the Corn Crake, which I could hardly have failed to do had there been any in the neighbourhood. Amongst the numerous little parties of Pied and Yellow Wagtails, the most careful inspection failed to detect either the White or the Grey-headed Wagtail; yet these well-marked species are not infrequent at Brighton. The Redbacked Shrike was late in arriving, but soon became common. Its favourite victim for impalement seemed to be the large yellow-tailed bumble-bee. I found two of these insects, about fifty yards apart, on the spikes of large dead brambles, and still alive. I found others last summer at Northrepps on dead thorns.

* The Cuckoo may have visited the Lark's nest merely for the purpose of depositing her own egg therein, and the broken Lark's egg may have been sucked by a field mouse.—ED.

OCCASIONAL NOTES.

A FOX CHASE IN LONDON.—On the 15th August a bagged Fox contrived to escape from its temporary place of confinement in the Metropolitan Market, and making its way along King's Road, turned down Raymond Buildings, and took refuge in Gray's Inn Gardens. Here, however, it could not remain long undisturbed, and a hue and cry being raised it was eventually recaptured by the gardeners.—J. E. HARTING.

ON THE PRESUMED MENTION OF THE HOOPOE, A.D. 1395.—In Ainsworth's 'Latin Dictionary' (Ross's edition, 1826), I find, under the head *Upupa*, "A bird called a Hoopoe, or, as some say, a Lapwing." May not the "vij upupis," quoted in 'The Zoologist' for August (p. 338) as costing twopence each, have been Lapwings, and the "xiiij plovers" at threepence each have been Golden Plovers—a bird more delicate for the table than the Lapwing, and therefore likely to command a better price? This seems to me more probable than that by the word "upupis" Hoopoes were in this instance intended.—J. H. GURNEY (Northrepps Hall, Norwich).

EARLY MENTION OF THE HOOPOE AS A BRITISH BIRD.—It has been suggested that the meaning of the word *upupa* in the document quoted by me (*antea* p. 337–338) is not "hoopoe," but "lapwing," a bird more likely to have been met with at the season, and in the numbers, indicated. Some dictionaries, indeed, give "lapwing" for *upupa*, as that of Ainsworth quoted by Mr. Gurney, and that of Adams (Edinb. 1814). The only two I have by me, however, are in favour of Hoopoe, and make no reference whatever to the Lapwing. Dr. Andrews, in his 'Latin-English Lexicon' (1854), gives "*Upupa* [$\epsilon\pi\omega\psi$], a hoopoe. Plin. 10, 29, 44; *id. ib.* 25, 36. Varr. L. L. 5, 11, 22"; and Dr. Wm. Smith, in his 'Latin-English Dictionary' (1857, based upon the works of Forcellini and Freund), adopts the same view in almost the same words. On looking into Cooper's 'Thesaurus Linguae Romanæ et Britannicæ' (1578), I find the following quaint but appropriate remark:—"Upupa, *upupa*, Avis, Plin. A birde no bigger than a thrush, and hath a crest from his bill to the uttermost part of hys heade, which he strouteth up or holdeth downe according to his affection. Wherefore it cannot be our lapwing, as it hath been taken for. It is rather to be called an houpe."* I presume that the inference intended to be drawn here is that the crest of the Lapwing was thought not to be erectile. If so this was a mistaken notion, since this bird, like the Hoopoe, is able to

* Mr. Turner, of Sherborne, states that these birds were known as "hoops" in Dorsetshire.

elevate and depress its crest at will. In old "Household Books" dated at the end of the fifteenth and beginning of the sixteenth century, the Lapwing is entered sometimes as "Pewit," but generally "wype" (compare the Swedish "wipa"), and the latter word is occasionally found coupled with "plovers," showing that by the last-mentioned name "golden plovers" were intended. I have not met with any instance of the use of the word *upupa*, in which it is clear from the context that the Lapwing is referred to; nor do I think it clear that this is so in the case in question.—J. E. HARTING.

FULMAR PETREL BREEDING IN THE ISLE OF FOULA.—So far as I know, the Fulmar Petrel, *Procellaria glacialis*, has not hitherto been known to breed in Britain, except at St. Kilda and in the Hebrides. I have often seen them in Shetland, and several specimens have been procured; but there was seldom more than one seen at a time. On June 4th, 1878, about a dozen pairs were observed hovering round the cliffs of the island of Foula, and at last they fixed on the most inaccessible cliffs on the island—a place that no native could reach, and where, according to their statement, no bird ever nested before. This stronghold was taken by the Fulmars, and they nested and brought off their young unmolested. This year they again made their appearance at the same date, only about double the number of birds. They have again taken up their quarters, and are said to defend it against all intruders from without, while their position secures them from the grasp of the daring islanders. They maintain the same position of undisputed right to their cliff that the bold and fearless Skua holds on the hills above them. The nests are placed on small ledges formed by the splitting of the rocks into layers, while the entire cliff seems so perpendicular that no foothold could be got for even the smallest bird. This is an addition to the number of our native birds, many of which have been considerably diminished of late, from the too easy access of collectors to their haunts. Those that have suffered most of late are the Red-throated and other Divers, the Grebes the Great Skua, and several of the Duck family.—J. GARRIOCK (Prospect House, Lerwick).

[If our correspondent will refer to Mr. Robert Gray's 'Birds of the West of Scotland' (p. 499), he will find that St. Kilda is not the only stronghold of the Fulmar. Besides Borrera and Soa, it used formerly to breed in the south isles of Barra; and in Skye, says Mr. Gray, it breeds in at least one locality—a "stack" off the farm of Tallisker, half way between Stack-na-Maidaidh and Breshal Beg. The nests are in holes in a very deep grassy slope, extremely difficult of access. The country people say there are many more breeding places of this bird in Skye. There is some reason also for supposing that at one time it nested at Mull.—ED.]

SEA BIRDS BREEDING AT SCILLY.—Up to last week (July 19th) Gulls and Terns have been breeding at the Scilly Islands. Young birds in all

stages of size, and nests with eggs, especially of the Terns, appearing naked, sat upon, and hatching—just what may be usually seen in the second week of June in ordinary seasons. I observe that authors do not refer to the rich creamy tint which is observable very often in the nestling and undeveloped plumage of several young Terns; and I am led to refer to this from having received an interesting specimen of the Sandwich Tern, which was captured a few days since in “Guthers,” one of the Scilly Islands, with the whole of the under parts from the chin and vent having this beautiful tone, which may be described as cream-colour, with a dash of salmon-pink in it, but very different from the roseate tint observable in the Roseate Tern and the summer plumage of the Little Gull, and sometimes in the Black-headed Gull. This tint which I have described in the young Sandwich Tern was observed in others, but not all, at the time it was captured. Mr. Dorrien Smith writes me word that in this island there are now “heaps of Sandwich Terns on their eggs, and nests with eggs.” With respect to what I have said as to this creamy tint not being mentioned by authors, in the figure of the Arctic Tern in Gould’s ‘Birds of Great Britain’ I observe there is shown in the young bird a slight blotch of yellow on the breast. I find, too, from Professor Newton, that this cream-tint has very often been observed by him in the Young Arctic Terns which have come under his notice.—EDWARD HEARLE RODD (Penzance).

HABITS OF THE HOUSE SPARROW.—Dr. Hamilton, in his interesting remarks on “The Birds of London” (p. 273), tells us that the House Sparrow is a “very early breeder,” in confirmation of which he states that a pair had nearly completed their nest by February 22nd, 1877, and that in the following year a pair had commenced building by March 2nd; but neither nest contained eggs, and none may have been laid for days, it being a hard matter to determine when a House Sparrow’s nest is completed. Though upwards of sixty years ago I first saw the London House Sparrow, I know nothing of its town habits, but here, in the country, I have not found it an early breeder. This season, for instance, some of the nests were not finished by May 19th, and only two of those examined had eggs, when the Rook, Starling and Blackbird had young on the wing. Mr. R. Warren concludes his notice of the birds observed in the County Mayo during the late severe winter by saying, “Of our large colony of Sparrows only one old cock has returned, apparently the sole survivor and representative of his race.” Though this colony of Sparrows had disappeared from Mr. Warren’s farm by January 1st, it does not necessarily follow that they perished; it is more likely, considering what a hardy bird the House Sparrow is, that food was sought for elsewhere. Birds were picked up, but it does not appear that any dead Sparrows were found.—HENRY HADFIELD (Ventnor, Isle of Wight).

NIGHT HERON IN SCOTLAND.—A friend has sent me a paragraph from a Scotch paper (the 'Glasgow Weekly Herald' of May 29th), in which it is stated that on the 23rd May last a Night Heron was shot off a tree on the banks of the Black Devon, adjoining Alloa Park Policies, by one of Lord Mar's keepers. I should be much obliged to any correspondent who may have an opportunity of learning further particulars if he will communicate them for publication in this journal. If the bird in question has been preserved it would be desirable to furnish a careful description of it, since it appears, from Mr. Robert Gray's account of the last Night Heron procured in Scotland ('Birds of the West of Scotland,' p. 284), that the latter was referable not to the European, but to the American form of this bird, by some considered to be specifically distinct.—J. E. HARTING.

NESTING HABITS OF THE STARLING.—I observe (p. 218) Mr. Christy is of opinion that two broods are occasionally reared in a season by the Starling, in proof of which he remarks:—"Another nest I found contained at the end of May (1877) young birds just ready to leave. . . . These flew all well, and about a fortnight after I found three eggs slightly sat upon." Now, considering the length of time that the young Starling is fed by the parent birds, I think it unlikely—not to say impossible—that these eggs belonged to the original owners of the nest. More likely far that another pair had taken possession of it. Though a close observer for many years of the Starlings nesting about the house, I never knew them to rear more than one brood in a season, nor have they done so this year. That they may occasionally do so is possible, and worthy notice, but I have no reason to doubt that their habit is to rear but one.—HENRY HADFIELD (Ventnor, Isle of Wight). ["That they occasionally do so" has been satisfactorily ascertained. See 'Zoologist,' 1876, p. 5164.—ED.]

LARGE FLIGHT OF SWIFTS.—On June 25th, at about 11 A. M., a large flock of the Common Swift, *Cypselus apus*, was observed flying in a north-easterly direction across the high road at Sudbury, Middlesex. This flock, in very compact order as to the main body, with stragglers hawking for flies as they went, proceeded slowly on their journey, taking nearly ten minutes in passing. Whether or not they were birds retarded in their migration to this country by the severity of the weather I cannot say, but should be glad if any of your readers could throw some light on the subject.—LIONEL P. FISHER (South Side, Harrow).

GOLDEN EAGLE IN THE LEWES.—On April 12th, I obtained a splendid pair of Golden Eagles, which were killed near Stornoway. The female is considerably larger than the male, and lighter in colour.—ROBERT W. CHASE (Birchfield, near Birmingham).

BLACK TERN ON THE THAMES.—While going up the river from Kingston to Windsor, on August 18th, I saw a Black Tern at Sunbury. It followed in our wake for some little way, and then passed our boat close enough to enable me to identify the species and to note that it was a young bird. Several species of Terns appear on the river about the periods of migration in spring and autumn, and sometimes stray a considerable distance inland, as, for instance, to the Serpentine, and the reservoirs at Kingsbury, Elstree, and Tring. Of these the Black Tern is perhaps the rarest.—J. E. HARTING.

KINGFISHERS IN LONDON.—Referring to the mention of the Kingfisher by Dr. Hamilton, as one of the “Birds of London,” in the July number of ‘The Zoologist’ (p. 289), may I add that on the 1st of March last I saw one fly across the Royal Toxophilite Grounds, Regent’s Park, apparently on its way from the ornamental water to the Botanical Gardens.—R. WALTERS (Ewell).

WILD GEESE IN THE ISLE OF WIGHT IN JUNE.—A flock of wild geese was observed late in the evening on June 30th, flying in two lines, at a considerable height, in a northerly direction. I had heard a day or two before of geese being seen passing over the Island, but doubted it until I had ocular proof, seeing that they are neither migratory nor gregarious at this season in general.—HENRY HADFIELD (Ventnor, Isle of Wight).

STURGEON IN THE THAMES AND MEDWAY.—Noticing a letter in the ‘Standard,’ of August 22nd, stating that a Sturgeon weighing seven pounds had been caught in the Thames, it has occurred to me that it might be interesting to the writer thereof, and your readers, to know that a gentleman and myself, with a bullet and a wire cartridge, shot one in the Medway above Maidstone Bridge, weighing one hundred and thirty-two pounds, and seven feet nine inches in length, which we sent to her Majesty the Queen at Windsor Castle on June 21st last.—ALEXANDER J. RUSSELL (Town House, Maidstone, Kent).

FOX SHARK OR “THRESHER” OFF THE COAST OF DEVON.—On July 29th a fine Fox Shark (*Carcharias vulpes*), measuring twelve feet in length and about four feet in girth, was captured in a herring net off the Start, and brought into Plymouth by some fishermen for exhibition. This fish had played great havoc with the net, but appears to have become entangled and captured by the “head-rope.” A few years since I recorded a small specimen that had been taken with a hook and line—a case of very rare occurrence.—JOHN GATCOMBE (Durnford Street, Stonehouse).

NOTICES OF NEW BOOKS.

A Hunting Expedition to the Transvaal. By D. FERNANDEZ DAS NEVES. Translated from the Portuguese by MARIANA MONTEIRO. London: George Bell & Son. 1879.

OUR relations just now with the Transvaal are such as to render any information concerning that country and the native races which inhabit it of more than ordinary interest to English readers, particularly if that information be supplied by one who is able to write from personal experience.

The author of the present work, having spent thirteen years in the Transvaal, has had unusual opportunities for informing himself of the nature and resources of the country from a mercantile point of view, and of the character and mode of life of the different tribes with whom he was almost daily brought in contact while pursuing his avocation, that of an ivory trader. The success which seems to have attended him in his travels is doubtless to be attributed to his humane and sensible mode of treating the natives. Instead of alarming, threatening, and endeavouring to coerce them, he always approached them in a friendly way, respected their customs, and made them liberal presents in exchange for anything he wanted, whether ivory or food. Now and then he fell in with people who, in spite of all his endeavours to persuade them to the contrary, would persist in believing that his intention was to dispossess them of their goods and kill them; and many a plot had he to upset by a counter plot, and by firm, energetic action. Some of his escapes were truly marvellous. On one occasion a hunter came running into camp with the intelligence that King Mahuéoé with eight hundred Kaffirs were approaching with the express intention of killing him. In a perfect downpour of rain, he had just time to reach the ford on the river Bembe, distant half an hour's march from where he was camped, and cross to the opposite side before the swollen torrent became unfordable, and, by the interposition of a natural barrier, effectually prevented his enemies from following him.

At times the author found himself in great straits for food,

for he had a numerous retinue to provide for, and fresh meat was not always to be obtained when wanted. His force consisted of one hundred and twenty carriers with bales of goods for trading with the Dutch; thirty with the merchandize proper for bartering for provender and provisions; three captains or guides for the carriers; seventeen hunters; sixty-eight negroes for transporting the necessary materials for the hunt; five carriers for his personal luggage; four servants; a second and third lieutenant in command, and four carriers for their separate use. In all mustering two hundred and fifty-three men. This was a goodly number to provide for, but none too many, on an emergency, to withstand the attacks that were made upon them.

The hunters appear to have made the most of their time and opportunities, and not only secured plenty of fresh meat in the shape of antelope and buffalo, whenever they had a chance, but also brought in a fair amount of ivory. Some of their encounters with wild animals are very graphically described, as, for instance, their walking up to a very large Lion in open ground (pp. 219—222); and, on another occasion, at night, seeing three Lions stalking a herd of twenty Buffaloes (pp. 249—251). They once came unexpectedly upon two dead Lions and a dead "Tuongonhe" (from the description, p. 48, note, possibly a Gnu), and the sight presented was a singular one:—

"One Lion was stretched full length on the ground, its huge jaws opened wide, while by his side lay a 'Tuongonhe' half devoured. The second Lion was lying a few yards from the first one; his sides were fearfully gashed, and a deep lacerated wound between his shoulders, where the enemy had inserted his teeth. The ground all about the beasts was pawed up—evident proof that a fierce struggle had taken place. The first Lion had certainly received some gashes on his ribs, and had a slight wound on his shoulders. Evidently this one had proved the victor, yet he was dead. Could it possibly be from the slight wounds he had received? We could not account satisfactorily for his death. Remarking, however, that his mouth was open to an extraordinary degree, and that his tongue was protruding, we found on examination that a large bone had stuck across his throat. No doubt these Lions had both attacked the Tuongonhe, and they evidently fought for their prey until one fell. The victor, perhaps famished, set at work at once to devour the Tuongonhe, and in doing so had eagerly swallowed a bone, which had stuck in his throat and caused a fearful death. The two Lions lay untouched on the ground, proving that

their encounter had taken place during the early morning; for, had the fight occurred in the night, the Hyænas would have devoured them."

The author states (at p. 224) that during his travels in Eastern Africa, he met with five different species of Lions. For "species," no doubt, we should read "varieties," and even then the variation must be regarded as dependent in a great measure upon age and sex. The colour and length of the mane goes for very little; and the best authorities of the present day seem to be agreed that there is only one species of Lion in Africa.

To the naturalist who may desire information concerning the fauna of the Transvaal this book will be disappointing, inasmuch as the author, although an intrepid hunter and a good shot, shows so little acquaintance with Natural History as to be unable to distinguish a deer from an antelope, and often failed to identify the animals he killed. Nor does he furnish recognisable descriptions. At page 67 he writes, "The deer or stag of Eastern Africa is twice the size of the European stag, and its horns differ considerably." There is nothing in the description which follows to enable an identification of the species, the only clue which he gives being the allusion to size, from whence it may be presumed that the Eland is intended. Elsewhere he speaks of seeing the horns of fallow-deer hanging up with other horns in a kraal which he visited!

His description of the largest Elephant procured by his party is somewhat startling. It is well known that the African Elephant attains a much greater height, and carries larger and heavier tusks, than the Indian Elephant. Mr. Sanderson, in his excellent book on the 'Wild Beasts of India,' says (p. 55), "There is little doubt that there is not an Elephant ten feet at the shoulder in India"; and he gives the exact measurements of some of the largest he ever saw. Sir Samuel Baker, writing of the African species in his 'Nile Tributaries of Abyssinia,' states that both sexes average about one foot taller than the Asiatic Elephant. Now what does Senhor Das Neves say?—

"During a hunting expedition which I made between Sofala and Inhambune, in the year 1864, I had the curiosity to measure the first Elephant killed on that occasion, and which proved the largest of all we destroyed. From the sole of his foot to the top of his back he measured thirty-eight *palmas* (spans of nine inches). As I had to get up on the top of his trunk to measure him, I may have made a mistake of four *palmas*,

certainly not more; therefore, I can safely state his height was not less than thirty-four *palmos*, or twenty-five feet six inches."

Now, with all deference to the translator, we are under the impression that "palmo" cannot mean a hand's span of nine inches, but the breadth of a palm, about four inches. This would make the height of the animal in question, not twenty-five feet six inches, but eleven feet four inches, which is consistent with the observations of the authorities we have cited.

We need not criticise the Natural History portion of this narrative further than to say that it is the weakest portion of the book. During his thirteen years sojourn in Eastern Africa, Senhor Das Neves had splendid opportunities for studying the fauna and flora of the countries through which he travelled; but, for want of the requisite training, these opportunities were unfortunately lost. His book is chiefly valuable for the insight which it gives into the manners, customs, and superstitions of the tribes which he encountered. The information which he has to impart is both instructive and amusing, and is given in a clear and fluent style, a merit which we suspect is due in a great measure to the translator, who seems to have performed her share of the work extremely well.

The Birds of Guernsey and the Neighbouring Islands, Alderney, Sark, Jethou, Herm; being a Small Contribution to the Ornithology of the Channel Islands. By CECIL SMITH, F.Z.S. London: Porter. 1879.

It is not a little surprising that until the appearance of the present volume we have been without any reliable information on the Ornithology of the Channel Islands. It is true that in Professor Ansted's work on this group an attempt has been made to give a list of the birds which were supposed to reside in or visit the islands; but this list is not satisfactory, since the excellent geologist by whom it was prepared made no pretensions to be an ornithologist, and was content to set down the name of every bird that was reported to him without furnishing any evidence of its occurrence. He enumerated 197 species as residing in or visiting the Channel Islands, but after careful enquiry Mr. Cecil Smith has come to

the conclusion that of these twenty-one at least should be struck out, and has accordingly reduced the list of species to one hundred and seventy-six.

From the geographical position of the Channel Islands it might be expected that the avifauna of the group would present some interesting features. There are some birds in France which seldom or never make their way to England; there are others which, although periodical migrants to both countries, never visit us in such numbers as may be seen in the more favoured south. Of both these classes we should expect to find representatives in Guernsey, and we are accordingly somewhat surprised to discover from the book before us that there is no bird in Guernsey with which we are not familiar here, and that many of the summer migrants to France are rarer in the Channel Islands than they are in England. For the absence, or at least great scarcity, of such birds as the Golden Oriole and Hoopoe, there appears to be some reason, namely, the changes which have taken place in the physical aspect of the islands during the last fifty or sixty years. Guernsey was formerly far more wooded than it is at present, and it is probable that the wholesale destruction of hedgerow elms, and the grubbing up of so many orchards in order to employ the ground more profitably in the culture of early potatoes and brocoli, by which the island has lost much of its picturesque beauty, has had the effect of deterring many of the occasional visitants from alighting here in their periodical migrations. But, if some species have decreased in number, owing perhaps to the causes suggested, for other reasons others have become more numerous. The Mistletoe Thrush, for instance, is stated (p. 32) to have greatly increased in numbers in Guernsey, especially within the last few years; and, although Professor Ansted's list confined it to Guernsey and Sark, it is now nearly as numerous in Alderney and Herm as any of the other islands.

On a great extent of the higher part of Guernsey, on both sides of what is known as the Forest Road, there is little or no hedgerow timber, the fields here being divided by low banks, with furze growing on the top of them. Furze brakes also are still numerous, the whole of the flat land on the top of the cliffs, and the steep valleys and slopes down to the sea on the south and east side of the island, from Fermain Bay to Pleimont, being almost

uninterrupted wild land, covered with heather, furze, and bracken. Besides this wild furze land, there are several thick furze brakes inland, in different parts of the island. This is the stronghold of the Linnet (which is far commoner in the island than the House Sparrow), the Greenfinch, and the Stonechat, while many other small birds avail themselves from time to time of the thick covert which is here afforded them. One would suppose it to be just the place for the Dartford Warbler; but this little bird is either so scarce or so difficult to catch sight of, that Mr. Cecil Smith has never seen it himself, and is only able to record a single instance of its occurrence there. The Goldcrest occasionally comes over in large flocks, apparently from Normandy. Several flocks, numbering many hundreds in each, have been observed to settle on different parts of the common before dispersing over the island. The rarer Firecrest is now and then met with, although not in flocks.

The Crossbill is said to be an occasional visitant to all the islands, and sometimes in considerable numbers; but, as in England, it is very irregular in the date of its appearance. Mr. Smith writes (p. 86):—

“My first acquaintance with the Crossbill was in Sark on the 25th June, 1866, when I saw a very fine red-plumaged bird in a small fir plantation in the grounds of the Lord of Sark. It was very tame, and allowed me to approach it very closely. I did not see any others at that time amongst the fir trees, though no doubt a few others were there. On my return to Guernsey on the following day I was requested by a bird-catcher to name some birds that were doing considerable damage in the gardens about the town. Thinking, from having seen one in Sark, and from his description, that the birds might be Crossbills, I asked him to get me one or two, which he said he could easily do, as the people were destroying them on account of the damage they did. In a day or two he brought me one live and two dead Crossbills, and told me that as many as forty had been shot in one person's garden. The two dead ones he brought me were one in red and the other in green plumage, and the live one was in green plumage. This one I brought home and kept in my aviary till March, 1868, when it was killed by a hawk striking it through the wires. It was, however, still in the same green plumage when it was killed as it was when I brought it home, though it had moulted twice.”

The absence of Rooks from the Channel Islands is noticeable. “I have never seen the Rook in the islands myself,” says Mr.

Cecil Smith, "even as a stranger." But Mr. Gallienne, in his notes to Professor Ansted's list, says, speaking of Guernsey, "The Rook has tried two or three times to colonise, but in vain, having been destroyed or frightened away." Mr. MacCulloch has observed that they sometimes visit Guernsey in large flocks in severe winters.

Kingfishers, adapting their habits to circumstances, "breed in holes in the rocks all around the island" (p. 102). Mr. Cecil Smith thinks the number of these birds is somewhat augmented in autumn by migrants, since he has seen more specimens in the birdstuffers' shops at that time of year than at any other. This, however, may perhaps be accounted for, to some extent, by its being protected during summer and early autumn by the local Sea Birds Preservation Act, wherein the *Martin pecheur* appears as one of the *Oiseaux de Mer*.

The Thick-knee, or Stone Curlew, is said to be by no means uncommon in winter—a fact for which ornithologists would be more or less prepared from Mr. Rodd's observations of its habits in Cornwall, who states that it is never seen in the Lizard and Land's End districts except in winter; and the only way to account for this deviation is to presume that a portion of the migratory party, in their southern flight in the autumn, hold a northern limit just reaching the Land's End and the Lizard lands (the most southern in the British Isles), the corresponding northern migration in the spring just taking the whole number above the southern latitudes of the extreme western counties.

The Kentish Plover Mr. Cecil Smith regards as a summer visitant to the islands, and he has found their nests after a long search on the sandy shores of Grand Havre and L'Ancrese Bay, Guernsey, as well as on the shell beach in Herm. He believes that they nest also in Alderney, where he has seen them during the breeding season.

The Turnstone is said to be resident throughout the year, its numbers being augmented in autumn by the arrival of migrants. The author has reason to believe that a few pairs even breed in some of the smaller rocky islands, where he has seen them in pairs during the month of June.

On the subject of sea-gulls, as might be expected, he has a good deal to say; but none of the Skuas are represented in his list. This is somewhat singular, since two species of these

parasitic Gulls are by no means uncommon on the English side of the Channel, about Torbay, during the autumnal migration.

On the whole we do not doubt that Mr. Smith's little book will prove acceptable to many, especially to those visitors to the Channel Islands who, without it, might search in vain elsewhere for reliable information concerning the birds which they are likely to meet with.

Natural History Scraps: more especially about Birds. By C. M. ADAMSON. Newcastle-on-Tyne: Bell & Co. 1879.

As a contributor for many years to the Natural History columns of 'The Field,' Mr. Adamson's name will doubtless be familiar to many of our readers. He is an observant naturalist, and in a quiet, unpretending way has from time to time contributed many interesting notes on the Ornithology of Northumberland (in which county he resides), which have appeared in the columns of our contemporary. These notes have now been collected and reprinted in an octavo pamphlet of 140 pages, and amongst them we note a few which do not appear to have been previously published—such, for instance, as the account of Prestwick Car (pp. 80—93), which used to be such a paradise for naturalists until drained in 1855.

It may be easily supposed the reclamation of such a place caused a great alteration in the fauna and flora of the district. "No similar place," says Mr. Adamson, "now exists in the North of England; it was, in fact, a small fen. At times it collected Swan, Geese, Ducks and Waders, unlimited as to species as well as quantity." Duck and Mallard, Teal and Shovellers, used to breed there; Coots and Moorhens abounded, and in the winter Little Grebes. Mr. Adamson states that he never heard of the last-named species being seen there in summer. This is rather curious, for the locality at one time was especially suited to its habits. Amongst other birds which used to breed on the Car may be mentioned the Curlew, Redshank, Ruff, Wood Sandpiper, Snipe, and Black-headed Gull; while Temminck's Stint and the Black Tern have been found there in June. Mr. Adamson's remarks on the habits of the Golden Plover and Snipe, as observed by him at this spot, are very interesting. "Besides birds," it would seem, "Pike, Perch, Roach, and Eels, and hosts of shells, plants, and

insects were located there. The birds, having wings, escaped annihilation, and have gone elsewhere; the fish and shells, of course, were destroyed entirely, and many of the insects and plants also, in consequence of the entire change; but, without doubt, another set of animals and plants has taken the place of the previous occupants, and certainly are of more use to man under the altered conditions, but hardly so interesting to the naturalist."

We have not space to extract from Mr. Adamson's pages many observations which are worth quoting, and which invite comment; such, for instance, as his "Naturalist's View of the Close-time for Sea-birds," and his remarks on the preservation of wildfowl. In a few instances, we observe, he has reprinted communications from other naturalists addressed to the Editor of 'The Field,' on subjects on which he himself has written. To this there can be no objection when the information is worth reprinting, and is "warranted genuine" by the publication of the writer's name; but we question the desirability of reprinting anonymous communications like that of "Aquarius," given at p. 79. This is a note on the Fulmar Petrel, wherein the writer states that he has "very constant opportunity of observing" these birds; that they dive freely, but in a peculiar manner, following the shoals of sprats or young herrings in great flocks on the wing, and dropping over them like a hailstorm; diving about six or eight feet beneath the surface, using wings and feet as most sea-birds do, but never diving deep or remaining long under water. Now this is an interesting fact if it could be substantiated, but as the reader is not furnished either with the name of the locality where the observation was made or the name of the observer, he is left in doubt whether the statement can be relied upon, and whether the writer was likely to know a Fulmar from a Manx Shearwater.

The omission of anonymous communications (unless made by persons known to the author as reliable observers and stated to be so) would not have detracted from the merits of Mr. Adamson's reprint; while its value might have been enhanced by the adoption of a uniform pagination throughout, and the addition of a good index, the single page of "Contents," miscalled "Index," being hardly sufficient for practical purposes.

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PROF. DODEL-PORT ON THE FERTILISATION OF RED SEA-WEEDS BY ANIMALCULÆ.

IN a recent number of the excellent periodical 'Kosmos,' Dr. Dodel-Port, the eminent botanist, of Zurich, has published the results of a series of observations made by him regarding the part played by Animalculæ in the fertilisation of a certain species of *Florideæ*, or red sea-weed, viz., *Polysiphonia subulata*, J. Agas. The paper is of great biological importance, since it forms, so far as our knowledge extends, the first record of the participation of animals in the fertilisation of cryptogams, which in itself is an interesting parallel to the relations existing between insects and phanerogams. We have pleasure therefore in presenting our readers with an illustrated abstract of the paper in question.*

In previous numbers of the periodical referred to, Dr. Hermann Müller has sketched the history of evolution of the floral world, and has shown the basis upon which the entire relation between flowers and insects rests. This basis is the transition of the male sexual cells from the liquid medium of water into the dry atmosphere which occurred at the upper boundary of the cryptogamic flora of prehistoric times.

In almost all cryptogams which are not agamic, the contents of the male cells are actively movable; when they leave the cell they move freely about in the water by means of vividly oscillating cilia. They thus possess the faculty of moving inde-

* For the translation from the German we are indebted to Mr. Carl Armbruster, and for the use of the woodcuts to the publishers of 'Nature.'

pendently, like any free aquatic animal, to the distant female organ, there to complete fertilisation. In the case of phanerogams the independent mobility of the pollen-grains is an impossibility. To effect the union of pollen-grains with that particular part of the female flower which is destined to receive them, some external agent must interfere. In many cases, especially in the lower orders of the floral world, the wind, gravitation, or both together, are the agents in question; in the majority of higher phanerogams, insects, or occasionally other animals, are instrumental in conveying the pollen.

Now there are a great number of cryptogams in which the male sexual cells which are emptied into the water do not possess the faculty of independent motion, as they are not endowed with cilia, and are therefore dependent on the action of external forces for their locomotion. To these belong the great and highly differentiated order of so-called "red sea-weeds," or *Florideæ*, chiefly marine plants which in form and colour develop a number of wonderfully beautiful varieties, which no one who has ever attentively observed them on the sea coast will ever forget. Their antherozoids, which are generally spherical, are discharged into the water as motionless cells, and are yielded up to the play of currents, in the same way as, in the anemophilous phanerogams, the pollen-grains pass as a dust into the atmosphere from the anthers, and are moved to and fro by the wind. There are many analogies between *Florideæ* and higher phanerogams as regards their sexual conditions. Thus amongst the former we find many species which are dioecious, similar to the lowest phanerogams amongst gymnosperms, and to others of higher order. The chances of fertilisation in their case are, therefore, similar to those applying to dioecious phanerogams. Often the male plants grow at a considerable distance from the female plants of the same species. In the spring of 1878 Dr. Dodel-Port, during a series of microscopical examinations of Adriatic red sea-weeds extending over four weeks, found only female and agamic (tetrasporous) specimens of *Polysiphonia subulata*, and looked in vain for male specimens, of which only at the end of his investigations he could obtain a few. Their respective localities of growth were evidently considerably apart, and yet at all times Dr. Dodel-Port found female specimens in all stages of fertilisation. The antherozoids ejected by the male plants

must have found their way to the distant female plants in spite of their own immobility and general passive condition. The sea-water, therefore, must have been frequently in vivid motion.

These facts being ascertained, the idea readily suggested itself that possibly animals might take part in the fertilisation, particularly as there is no lack of small marine animals roaming about in the *Florideæ* forests, such as Infusoria, Crustacea, Annelids, Starfish, Bryozoa, Sponges, &c. But what particularly attracted Dr. Dodel-Port's attention was the regular occurrence of innumerable bell-shaped animalcules (*Vorticella*) on the shrub-like branches of *Polysiphonia subulata*. On closer investigation of the phenomena of fertilisation in the female organ, during and after adhesion of the antherozoid with the trichogynium, Dr. Dodel-Port eventually arrived at the conviction that in the case of *Polysiphonia* the little *Vorticellæ* facilitate the conveyance of the antherozoids to the trichogynium, and that they act according to a natural law, in the same way as do the pollen-collecting bees when, by visiting the willow-catkins, they assist in their fertilisation. The investigation of the sexual conditions of *Florideæ* is as yet in its infancy; it is to be hoped that more numerous researches in this direction will shortly be made, and possibly relations may be found to exist between other species of this order and certain animals similar to those discovered by Dr. Dodel-Port in the case of *Polysiphonia* and *Vorticella*. The details of the interesting relations in this case are briefly as follows:—

Fig. 1 represents the male reproductive organ (antheridium) of *Polysiphonia subulata*, magnified 480 times. These antheridia often appear in large numbers at the upper branch-ends of the male plant, laterally close to the apex which continues its growth, at the spot where in the vegetative state young branches would form. In their earliest stage the antheridia consist, like the young branches, of a single row of cells. By repeated longitudinal and lateral divisions a polycellular body is soon formed, which begins with a short stem-cell (*st*), and which on the side furthest away from the maternal thallus-branch is protected by a forked hair (*gh*). The ripe antheridium in external appearance reminds one very much of a maize-cone; a row of four to six cylindrical cells (*aa*) in the axis of the whole organ represents the spine of

the cone, while the surface is covered by numerous spermatozoid mother-cells (*sm*, *sm*) representing the grains of maize. Before the antheridium is ripe the latter are polyhedral; but afterwards they assume a round shape, as the drawing shows. All parts of the male organ are colourless; the antherozoid mother-cells are filled by a fine granular plasma, which is soon differentiated into a round body, and subsequently discharged from the mother-cell as an antherozoid (*ss*). Thus within a short time the ripe

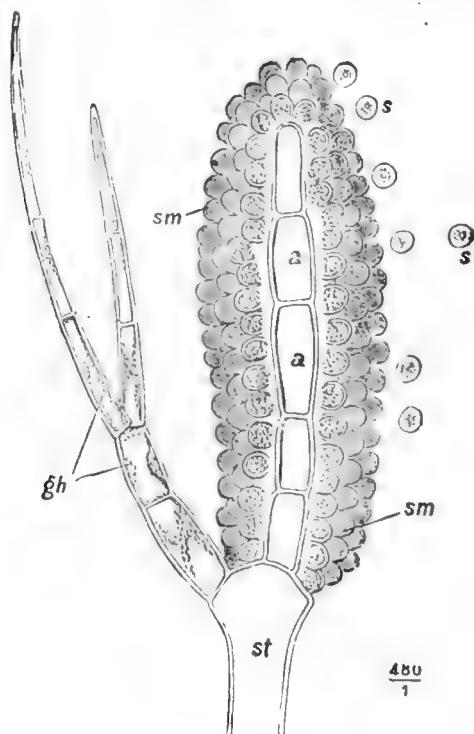


FIG. 1.

antheridium discharges some 400 to 800 spherical antherozoids into the surrounding sea-water. The single antherozoid is a little globule of protoplasm, without cell-wall or any locomotive organ. In the centre of this globular primordial cell a strong magnifying power shows a little nodule which strongly refracts light, and round which a few smaller colourless plasma-granules are grouped. As it freely floats in the water, the antherozoid is analogous to a pollen-grain of an anemophilous phanerogam.

The female reproductive organ of *Polysiphonia subulata* is a polycellular carpogonium of relatively high differentiation.

It originates upon the female plant closely below the apex of the thallus-branches, and generally there are several of them forming successively at varying intervals from the branch-end downwards.

Fig. 2 shows the carpogonium-bearing branch-end of a female specimen of *Polysiphonia subulata*; *cg'* is a very young carpogonium; *cg*, *cg* are two mature ones; *t'* and *t''* two trichogynia; *Vort.* are two *Vorticellæ*. The whole is magnified 300 times.

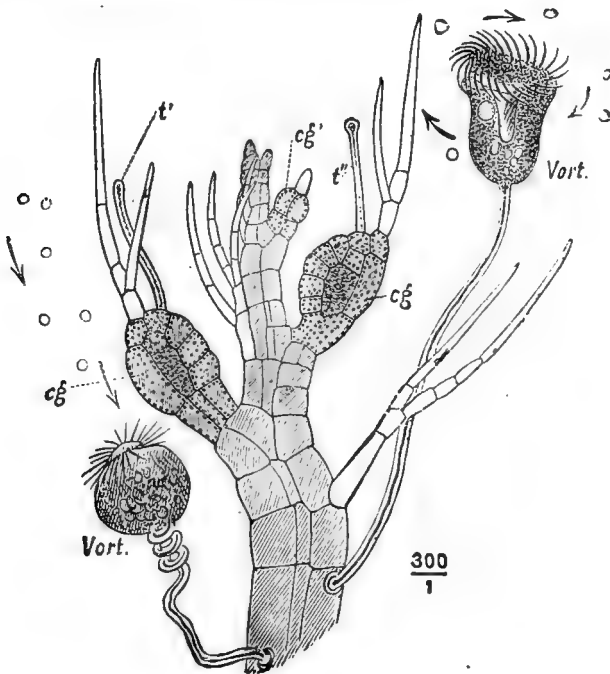


FIG. 2.

In Fig. 3 a carpogonium (*ca*) is represented, magnified still more (480 times); *Vort.* is a *Vorticella*; *ss* the antherozoids. In the mature state the carpogonium consists of three essential parts, *viz.* :—

1. The basal portion, *f* (Fig. 3).
2. The fertile spore-forming part, *cg*.
3. The hair apparatus, *t* and *gh*.

The basal portion (*f*) consists of five tubular cells running parallel to each other, of which in Fig. 3 only two are seen. Then follows the fertile part (*cg*), which is an oval cellular body, consisting of some 20 to 26 cells. A central cell, copiously filled with granular protoplasm, is surrounded by a number of irregular, peri-

pheric cells, and awaits fertilization, in order afterwards to transform itself into the spore-forming apparatus, while the remaining 19 to 25 peripheric cells become the case of the spore fruit through further divisions (see also Fig. 4, *h h*). The uppermost part of the female organ is the hair apparatus, which in *Polysiphonia* consists of the forked hair (*gh*), and the trichogynium (Fig. 3, *t*). The forked hair forms very early upon the young carpogonium, and indeed

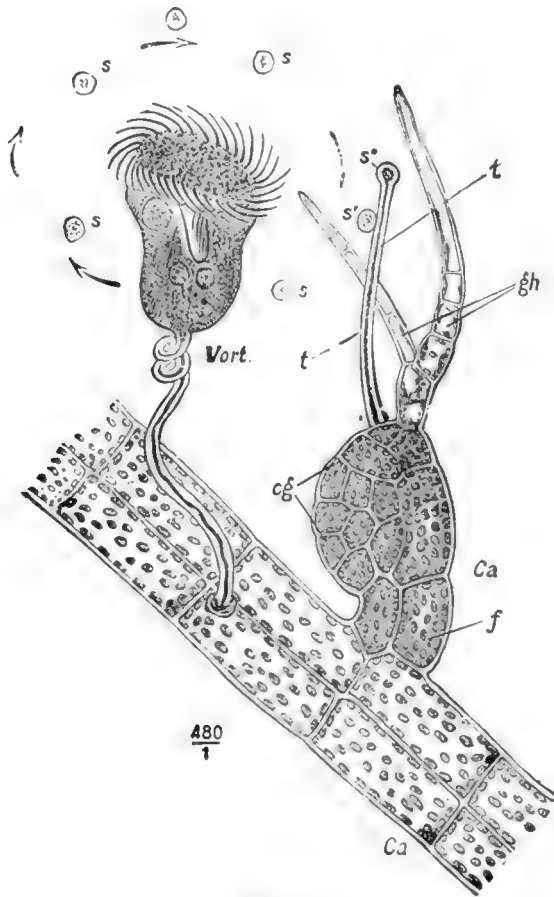


FIG. 3.

long before the trichogynium is formed; its position is always upon the true apex of the whole organ, although at times it stands apparently laterally from the apex. The duration of its existence, its presence at the time of fertilisation and its disappearance immediately afterwards, prove it to be an organ of some use in that process. The most essential and important part of the hair apparatus, however, is the trichogynium (*t* in Figs. 2 and 3)—*i. e.*, the receptive organ, which in *Florideæ* has a similar

signification to that of the elongated style in many phanerogams, while the central part (*cg*) of the carpogonium is the analogue of the closed ovarium of angiosperms. The trichogynium is a tender, colourless hair consisting of but a single cell, which rises from the carpogonium laterally from the apex of the latter, and does not quite attain the length of the forked hair (*gh*). It forms just about the time when all other parts of the carpogonium have attained that degree of differentiation which they possess during fertilisation. In the full-grown state, the trichogynium is of the same thickness in its entire length, and rounded off suddenly at the upper end. The narrow canal of the trichogynium contains colourless finely-grained protoplasm.

Now if antherozoids of *Polysiphonia subulata*, freshly discharged by the antheridia of male plants and accidentally carried near by currents, come into contact with the upper part of the trichogynium, they get firmly attached to the latter. It is particularly the apex of the trichogynium which possesses the faculty of retaining the globular antherozoid. Then the granular protoplasmic contents of the antherozoids pass into the interior of the trichogynium (Fig. 3, *s''*). A part of it descends down the trichogynic canal into the carpogonium, giving the fertilising impulse to the central cell of the carpogonium. This process is quite similar to the corresponding one in phanerogams.

As the antherozoids of *Florideæ* are wholly devoid of active locomotive organs, the possibility of fertilisation—*i.e.*, the coming into contact of the antherozoids and trichogynium—of course rests entirely upon a lucky chance. The antherozoids reach the female organs passively, either by their own weight, or through the currents of the water caused by waves, wind or tides, and doubtless in many cases through the incessant movements of some marine animals. The greater the distance between antheridia and carpogonia the smaller, of course, are the chances of fertilisation; the more violently the water is moved about in the vicinity of and between the separated organs, the more probably will the lucky accident of the union of both elements take place.

During a long series of investigations of the reproductive phenomena of *Polysiphonia*, Dr. Dodel-Port found regularly on the bushy thallus, and particularly upon the uppermost and younger branches, an enormous number of the well-known stalked

animalcules, *Vorticellæ*, which had settled there, and were as usual in incessant motion. Often they appeared in dozens in the field of the microscope, and with the constant vibration of their cilia were very troublesome, until Dr. Dodel-Port discovered their friendly co-operation in the fertilisation he was studying. He was a frequent witness of the process depicted in Fig. 3, where numerous antherozoids were whirled round and round in the whirl produced by a *Vorticella*, and where antherozoids frequently came in contact with the trichogynium, and remained attached to it (Fig. 3, *s'* and *s''*) for a longer or shorter period. It was

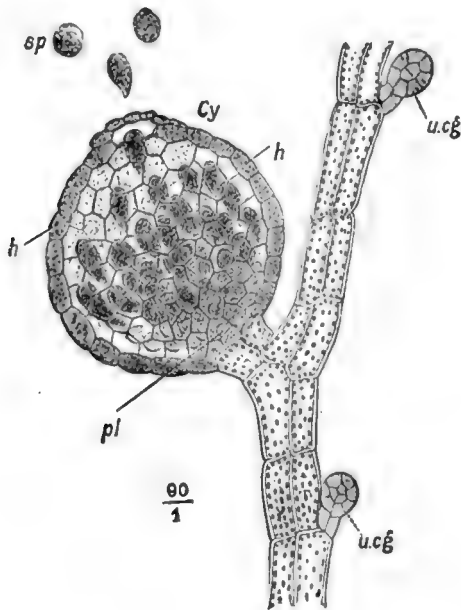


FIG. 4.

entirely due to the motion caused by *Vorticellæ* that Dr. Dodel-Port was enabled to follow the phenomenon of the attachment of the antherozoids to the trichogynium from beginning to end. The motions of the *Vorticellæ* are particularly varied through the repeated contractions of their stalks into short spirals, and thus they cause various currents in the water, by all of which the antherozoids are carried along, like any other small and passive body that may be suspended in the water. (Compare Fig. 2, where one of the *Vorticellæ* is just contracting its stalk, the arrows in each case indicating the direction of the currents.) The presence of numerous *Vorticellæ* thus imparts to the passive antherozoids a kind of motion much resembling that of the

sperm-cells of other cryptogams which are endowed with active cilia. *From this it follows with mathematical certainty that the probability of the antherozoids finding their way to the trichogynium in the presence of Vorticellæ is immensely greater than would be the case if there were no animals present.*

At the same time it is evident that this probability is further increased in the case of *Polysiphonia subulata* through the presence of the forked hair (*gh*) in the vicinity of the trichogynium, because the whirls caused by the animalcules will often be cleft by the forked hair, and thus secondary whirls will be produced. Often, in *Polysiphonia*, carpogonia were found which were not fertilised. Thus Fig. 4 represents a ripe and spore-ejecting cystocarp (*cy*) and two carpogonia (*ucg*) which remained unfertilised. This was particularly the case on thallus-branches which were less densely crowded with *Vorticellæ*—another, although negative, proof of Dr. Dodel-Port's theory. It is not particularly remarkable that *Vorticellæ* should inhabit *Polysiphonia* in large numbers, because these animalcules, as Dr. Dodel-Port observed, feed with predilection on the antherozoids of this plant. Thus we have here a condition of things similar to the relations between certain flowers and pollen-consuming insects. The consumption of antherozoids by *Vorticellæ* is, of course, far too insignificant to merit any consideration, particularly if compared with the great advantages regarding fertilisation which the presence of the animalcule brings with it. Moreover, a comparison of the male plant of *Polysiphonia* with a female specimen shows that here also, as in most phanerogams, thousands more male cells are formed than are necessary for fertilisation.

After fertilisation the carpogonium develops into a cystocarp, *i. e.*, the spore-forming fruit (Fig. 4). Shortly after fertilisation has taken place the whole hair-apparatus disappears. The wall-cells of the carpogonium now begin to grow quickly and divide by membranes perpendicular to the surface. They form a cellular case (Fig. 4, *h*, *h*), which has an orifice in the apex, long before the spores are ripe. In the meantime the central cell of the fertilised carpogonium begins to form a number of densely-packed short branches, which, as a series of cells radiating in all directions, fill the basis of the capsule-shaped fruit. The central cell is therefore called the placenta-cell. At the ends of the ramified cell-series which radiate from it, pear-

shaped and dark red spores (carpospores) form, which, as soon as they have attained a certain size become detached and pass into the water through the orifice at the apex of the cystocarp. In this state they are perfectly capable of further development, and soon begin to germinate.

Dr. Dodel-Port concludes his interesting paper with the following suggestive remarks:—"The total absence of active organs of locomotion in the antherozoids of *Florideæ* points to a common ancestor from which the different branches of the *Florideæ* have inherited the immobility of the antherozoids. No doubt that during the differentiation of the red sea-weeds many forms have died out in consequence of the fertilisation not taking place through the passivity of the male cells, while other forms have retired to localities which through active water-currents favour the process of fertilisation in spite of the immobility of the antherozoids. It is now well known that most of the existing *Florideæ* are found on the coasts of warmer seas which are constantly washed by the waves, while the northern coasts, which are covered by crusts of ice during a great portion of the year, are very poor in red sea-weeds. Future researches will show in many of these aquatic plants how far the differentiation of the genera took place in the sense of an adaptation to the small marine animals which inhabit them, and favour their fertilisation in the way pointed out. If many sea-weeds in their bushy shrub-like thallus harbour certain infusoria, bryozoa, hydræ, sponges, crustacea, annelids, and small star-fishes, and afford them excellent hiding-places or nourishment, so that these animals inhabit them with special predilection, then it is certainly possible that occasionally a correlation was formed, or adaptation took place, which was mutually advantageous, and which would find numerous analogies in the domain of the multiple cross relations between the higher flowering plants and insects. In this sense it is considered a duty to submit to the criticism of biologists a point hitherto overlooked in the biology of red sea-weeds, and bearing upon the explanation of the morphological differentiation of submerged aquatic plants."

THE NATURALIST IN NIDDERDALE.

BY JOSEPH LUCAS, F.G.S.

(Concluded from p. 370.)

Pateley Bridge lies at the centre of a circle of somewhat over forty miles radius that passes through several points on the eastern and western seaboard. Thus it is forty-one miles from the Tees-mouth, forty-three from Morecambe Bay, forty-seven from the Ribble near Preston, and forty-five from the Humber at Goole. This central position, taken with the great vertical range of the district, 100 to 2300 feet, is eminently favourable for the occurrence of birds, resident, marine, migratory, and casual. Sea-birds occasionally find their way across, and perhaps I should say not uncommonly, if all the occasions on which they have done so had been placed on record. In the summer Gulls slowly flap their way all along the eastern slopes of these hills. In June, 1868, I saw one above Billing Hill, in Airedale; on July 29th, 1869, one over Haverah Park; and on May 11th and 13th, 1871, a Lesser Black-backed Gull at Kettlewell, in Wharfedale. A young Gannet, in speckled plumage, was found on Bewerley Moor (1000 feet) in 1858, and is now in the possession of Mr. Yorke, of Bewerley Hall.

In the absence of any recent records of the Golden Eagle in the district, the names of "Arna Nab," "Arncliffe," "Arnagill," indicate that it formerly bred on these hills. Buzzards are occasionally seen on the moors. At Christmas, 1868, Mr. Yorke's keepers trapped a Common Buzzard on Gouthwaite Moor (1200—1500 feet). Mr. Ormerod shot a Rough-legged Buzzard on the moors near Lofthouse about 1864. The Rough-legged Buzzard is said to be commoner here than the Common Buzzard. The Merlin breeds on the moors. On February 22nd, 1868, I saw one a few miles west of Bradford; on June 12th, 1869, one on the moor behind Guy's Cliff (1100 feet), a magnificent cliff with a northerly exposure, over 100 feet in height, in the lower part of Nidderdale. Its flight is swift, low, and graceful. As it flies its wings seem sharper than a Kestrel's, and its tail thinner, approaching the appearance of a Swift. The last week in June, 1869, Mr. Yorke's watchers found a Merlin's nest on Ramsgill Moor (1250—1500 feet, N.E. exposure), with four young birds.

On July 1st, 1869, I saw a Red-backed Shrike at Hole Bottom (950 feet), a dell full of trees and bushes, slightly exposed to the S.E., chattering and making a great noise. It is here a rare bird, as I have no other record of its occurrence. Says Chaucer, in 'The Friar's Tale':—

. "As full of jangles,*
As full of venom be these *Wariangles*." †—V. 6990.

These birds commence their autumnal migration in July, when they are to be seen along the coast of Sussex. On July 30th and 31st, 1867, I saw two at Heene, and on August 7th and 8th S. F. Lucas shot two migrating.

The Tits, at least the Great Tit and the Blue Tit, are clever mocking birds. On January 24th, 1868, I heard the Great Tit uttering a cry like that of the Wryneck, but not so loud and sweeter. I have noticed the same note in the Lesser Spotted Woodpecker, and a young Kestrel. In 1867 there was an extraordinary abundance of holly-berries at Heene, Sussex. The Blue Tit (August 9th) was constantly in the holly bushes, in company with a Blackbird, cutting off the berries, the ground being strewn with them. On Sunday, October 25th, 1868, at Pool, Wharfe-

* "Chattering."

† Mr. Speght explains "*Wariangle*" to be "A kind of birds full of noise, and very ravenous, preying upon others, which when they have taken, they use to hang upon a thorne or pricke, and teare them in peeces and devour them." A faithful description of the habits of the Red-backed Shrike. Cotgrave's 'French Dictionary,' published 1650, translates *arneat* by "The ravenous bird called a Shrike, nym-murder, *wariangle*." The word is derived from the Old French *guare*, war, and *jangler*, to chatter. Now *guare* is one of the warlike terms of German origin which the Roman inhabitants of Gaul, or the "Old French," picked up from their enemies in the battle fields by the Rhine (Max Müller, Lect., 2nd ser., p. 263). It was first heard probably as a war cry, as Cotgrave gives it, "*guare*, *guare*, war, war." The Anglo-Saxon "*Serie*" is rendered by Manning, in his 'Gothic and Anglo-Saxon Dictionary,' by "*Turdus*," i.e., *Turdus viscivorus*, the Screecher. The Old Norsk *Skrikja* is rendered by Cleasby, in his 'Icelandic Dictionary,' "The Shrieker," and *Sól-skrikja* (i.e., sun- or day-shrieker), "Shrike, Butcher-bird." ('Itinerarium,' or Travels of Eggersh Olafsson, 1772, p. 582), while the modern Swedish *Skrikja* is the Jay, another "screecher." "Shrikes Wood," near Bewerley, takes its name from either the present species, or the Jay. It is also noteworthy that *jangler* in Old French first meant "to chatter like a bird," but afterwards came to mean in English *jangle*, "to quarrel," while *jangler* dropped out of the French language. It is consistent with this and the above that the chatterer which was first said to "jangle" was a quarrelsome chatterer, the Red-backed Shrike. But what a volume of cruelty is compressed into the name *nymmurder*, which expresses that which pursues, seizes, and tears to pieces, and so murders! (Old Norsk *ninna*, to pursue; *myrdir*, murderer).

dale, I watched from inside my window a Blue Tit busily engaged in pecking at the apparently bare bark of a trained cherry tree, on the young shoots and buds, and when he had gone I looked to see what kind of food he had been eating. The extremities of the young branches and buds were covered with the Aphis, much changed in colour, very few being the light green they are in summer; they were dirty brown and black. The Blue Tit, through the autumn, goes in flocks with the Cole Tit and Great Tit, together numbering perhaps fifty birds. They like the sheltered deep valley of the Washburn, where all three kinds abound. The Blue Tit has a powerful, sprightly note like "Chickwéed, chickwéed, chickwéed," quickly repeated. The Long-tailed Tits go in little flocks of six or seven; they have a sweet little single note, a straightish flight, stronger than one would expect, with their long tails stuck out behind. It is uncertain whether one of the Tits is meant in the lines:—

"Parus enim quamvis per noctem tinnipet omnem
At sua vox nulli jure placere potest."*

The Pied Flycatcher breeds in Bolton Woods, near Barden Tower, Wharfedale; at Bewerley and at Harefield Wood, Pateley Bridge, Nidderdale; and at Hackfall, near Masham, on the Ure. All these are deep wooded valleys. They rear two broods in the course of the summer; the first brood is brought off in May. On July 15th, 1869, the second brood flew from the nest at Bewerley. At Harefield Wood the site chosen was in an old wall, which can be entered in three ways, two of which are easy to the bird, and the third so narrow as to cause it to squeeze very flat to go in or out; nevertheless this is the one generally chosen. The cock appeared to build the nest, and used to prevent the hen from approaching till it was ready. Harefield Wood is on the west side of the hill, is admirably protected from the north and east, and is itself cover from the west. Accordingly it is one of the very few places in the district of which it can be said that it abounds with Whitethroats, Lesser Whitethroats, Spotted Flycatchers, Red-

* From a very beautiful little Latin poem of the third century, called "Elegia de Philomela," written by Albus Ovidius Juventinus (about A. D. 210). It expresses the cries of forty-one different birds by appropriate verbs, and is the sole authority for the meaning of several of the Latin names. It is to be found in the "Anthologia veterum Latinorum epigrammatum et poematum." Henricus Meyerus, Lipsiæ, 1835. Several pretty verses are cited in the present notice.

starts, Robins, Chaffinches, and at least two pairs of Pied Flycatchers. The Pied Flycatcher has a melancholy little "tweet," very like the Spotted Flycatcher. They dart from the wall, &c., just as the Spotted Flycatcher does. They are a trifle more sprightly, not quite so downcast-looking as the latter, and evidently have the mastery of it. They are naturally very tame. The Spotted Flycatcher is far from common. In 1868 I did not see one till May 8th, when I saw one in Jonas Wood, near Farnley Hall, Wharfedale. This bird feeds its young after they have left the nest. It utters a weak, piercing note.

The Kingfisher is very rare, I should say almost exterminated. On March 4th, 1868, I saw one on the River Aire near Bingley; and on November 9th, 1870, one at Burrill Wood (350 feet), in a narrow "clough" with well-wooded sides, sheltered, and one at Mickley (175 feet), on the River Ure, where it flows through broad meadows.

The Raven, which has given its name to a great many places, is now confined to the wildest and most elevated parts of the West Riding. I have only seen it twice. On July 23rd, 1868, I picked up a young Raven at Carlton, on the south side of Otley Chevin; and one hot day (May 6, 1871), after a wearisome climb to the summit of Pen-y-ghent, J. R. Dakyns and myself watched a pair wheeling about, croaking hoarsely, at a great height above us, doubtless taking us for carrion as we lay motionless upon our backs enjoying their beautiful evolutions. *

I have never known the Hooded Crow to breed on these hills, nor even to stay the summer. In 1868 I saw the first on October 20th, at Yeadon Ghyll, and on the moors near Lanshaw House (800 feet); in 1869, on October 13th, at Appletreewick, Wharfedale; in 1870, on October 28th, in some fields near Newton

* Max Müller remarks, "The Emperor Julian, when he heard the Germans singing their popular songs on the borders of the Rhine, could compare them to nothing but *the cries of birds of prey*." The original (in the 'Misopogon,' written about A.D. 352) has τοῖς κρωγμοῖς τῶν τραχὺ βοῶντων ὀρνίθων, and the Latin translation in the Leipzig edition of 1696 has "clangorum quos aspere clamantes aves edunt," while Eugene Talbot, in his French translation, 1863, gives "cris rauques de certains oiseaux," but boldly adds in a foot-note, "*Les corbeaux*." See Voltaire, 'Essai sur les Mœurs,' Preface. Clangorum is not a good rendering of κρωγμοῖς, for the "Elegia de Philomela," which was written 140 years or so before Julian wrote the 'Misopogon,' says, "Clangunt porro Aquilæ . . . et crocitat Corvus." Crocito is for *crocio*, Greek κρώζω, κρώξω, to croak as a Raven or Crow, from which κρωγμός, a croaking noise.

House, in the flat country of the Vale of Mowbray (110 feet). These birds are very plentiful in Norway, where they breed in the summer, as I have observed in 1870 and 1871. The Hooded Crow is a noticeable bird, and has attracted my attention when quite two miles off. It has far greater power of wing than a Rook. Rooks begin to build in February. They rob old nests to build the new, and apparently wage war upon each other's colonies, as they both bring twigs to and carry twigs away from the same rookery. Rooks begin to take long flights at least as early as September, when they fly to the salt marshes by the sea. They are seen during the summer high up on the moors, often when there are no other birds visible. The Jackdaw is a bird of the low country, but the Magpie goes up the dales and gills, only stopping short of the moors.

“ *Pica loquax varias concinnat guiture voces,*
Scurrili strepitu quidquid et audit ait.”

The Jay also keeps to comparatively low country; it occurs in some of the large “falls,” or “hangers,” in Airedale, as in Calverley Wood, at 225 feet, and in large woods throughout the district.

The Nuthatch is rare; I have seen it only once, in the deep wooded gorge of Hackfall (500 feet). The Wryneck and the Tree Creeper, common in the South of England, I have never seen anywhere in the district. In December, 1868 or 1869, Mr. Ormerod shot a Lesser Spotted Woodpecker in Bak'stone Gill, near Loft-house; but it is a rare bird here.

The Cuckoo ranges from sea-level up to the high moors, where they ascend as high as Ring Ouzels or Titlarks are found to make nests for them. In spring, up to 1200 feet or higher, there are few places on the moors in which it is possible to be out of hearing of a Cuckoo. Cuckoos begin to go in little flocks of six or seven by the end of July or beginning of August. On August 2nd, 1867, I saw in Surrey a flock of six Cuckoos in the plumage of the first year, and later in the day a second group of four, also in the plumage of the first year. They arrive in April in flights of twenty or thirty birds. The Cuckoo has a long, plaintive, somewhat wailing note, very soft and musical. It has also a rattling note, not altogether unlike that of a Landrail. Cuckoos vary much in colour, some young birds being dark ash-coloured, or cinereous;

others dark rufous, resembling the colour of a Kestrel; while some are intermediate and tinged with both colours.

The Evejar occurs in the district. On May 8th I started one in Jonas Wood, near Farnley Hall, Wharfedale, and I have also seen and heard them in the woods under Guy's Cliff, Nidderdale. They begin to migrate early in August, when they appear on the coast of Sussex. This, I presume, from its jarring noise, is the "Gable-ratchet," its note resembling the noise made by a small ratchet-wheel. It has also a piercing, distressed note, which sounds from several different places. Like the Grasshopper Warbler, this bird seems gifted with ventriloquial powers.

The Swift frequents some of the higher ground. They do not associate with Martins, and are never seen in the same air together. When Swifts fly high, Martins may be seen nearer the ground; but when Swifts are low there are no Martins. Martins ascend to the Dale Head. Sand Martins I have seen only twice in the district: at Apperley Bridge, Airedale (about 200 feet), where they build in the sandy river bank; and on the Ure below Tanfield. In a gravel-pit here (150 feet) there was one lenticular bed of sand, one foot long by six inches thick in the middle, and in this I found a Sand Martin's nest with eggs on June 12, 1870. This bird does not seem to ascend above two or three hundred feet. The highest elevation at which I found a Pied Wagtail's nest was 1050 feet, near the Dale Head. This was on the face of a limestone scar, in a tuft of moss covered with long slender grass, six feet above the waters of the Nidd; young birds, May 21, 1871. The hole was bored into the clump of moss from low down in the side; nest made of grass. Pied Wagtails arrive in parties of forty or fifty early in April. On March 11th, 1868, I saw a pair of Grey-headed Wagtails beside the canal near Manningham. Striking points are the head being a much lighter grey than the back, and the small size of the bird.

The Titlark breeds on the moors, especially on the grassy moors. I give the descriptions of three nests, taken down from nature in 1871:—

No. 1. Near Carlton, Coverdale, N.W., 1000 feet, May 19.—Open grassy moorside bank above little running stream. Bent-grass nest, round; five eggs. Internal diameter, $2\frac{1}{2}$ inches. Length of eggs, .75 in.; breadth, .6 in.; ochreous ground, thickly

covered with dark brown stains, blotchings, and markings—darker at larger end; still darker lines and streaks at larger end.

No. 2. Near Lodge, Nidderdale, S.W., 1600 feet, May 22nd.—Open grassy moor, nest with three young birds in a tuft of ling and bents. Young birds covered with long grey down.

No. 3. Angram Pasture, Nidderdale, S., 1350 feet, May 23rd.—Found a Titlark's nest with eggs. Instead of being all dark, they were dark only at upper end, with usual darker markings and stripes. The lower halves were very pale greyish ochre, almost white. The bird was distinctly striped down the breast.

On February 22nd, 1868, I saw an immense flock of Chaffinches, which must have numbered some thousands. They were in beautiful bright feather, apparently all cocks. A strong west wind was blowing, with hail and rain, and they took shelter in the low hedges. The place was a steep hillside, two miles east of Shipley, Airedale, facing north-west, in the teeth of the wind.

The Redpoll breeds in Nidderdale. On May 19th, 1869, I found a nest in an alder bush on the bank of the Nidd (about 390 feet), just above the weir at Pateley Bridge. The nest was in a fork a few feet from the ground, composed externally of roots and twigs. Four eggs; small, pale bluish green, spotted and streaked at larger end with brown.

I noticed the Bullfinch on four occasions only, as follows:—November 9, 1870. Hedges near Rasp Wood, three miles S.W. of Bedale, sheltered situation (375 feet); Nov. 29, 1870. Ellington Firth, in valley in large wood, sheltered (500 feet); Dec. 6, 1870. Roadside hedges between Azerley and Kirkby Malzeard (375 ft.); June 13, 1871. Follifoot Ridge, western exposure, summit of ridge (400 feet).

The only Crossbills I have ever seen wild stayed for some time in the autumn of 1874 at Sandsend, near Whitby.

Starlings go right up to the Dale Head, but I do not remember seeing them on the moors. They begin to flock in June, as I observed near Bewerley, June 17th, and again early in August, 1869. In February the Starling sits upon a twig and sings three notes; one as if his beak were chattering with cold, another like in sound to the Corn Crake's, but far less loud, and a third like the clucking of violin-strings with the finger. It utters also a fourth note—a long sweet cadence gradually dying away and descending the scale at the same time.

The Dipper I did not observe in the Aire below Shipley, doubtless on account of the polluted state of the river; nor in the Wharfe below Otley; nor have I noted it in Nidderdale below Pateley Bridge; nor in Washburndale below Blubberhouse. In the Ure, however, I have seen it as low as Ripon (90 feet). It follows almost every beck right up on to the moors. They are generally seen singly, sometimes in pairs. On May 9th, 1869, I watched two Dippers in the afternoon flying about over some shallows near Ramsgill. They kept chasing each other at a great pace, flying close above the water. In order to escape its pursuer, the pursued now and then followed through the water, entering and leaving it without any apparent check. I was astonished at the freedom with which they could transfer themselves from the air to the water or the water to the air. Even a duck seems to rise out of the water with difficulty. They rested frequently on snags, stones, and roots of trees, and kept up an incessant "chip, chip," quickly repeated. The Dipper's nest is sometimes so placed that the bird would have to fly through the water every time it entered or left the nest. They frequently build under waterfalls.

I observed the first and last flocks of Fieldfares as follows:—Stainburn Moor (800 feet), October 15, 1868; Crag Wood, near Brimham Rocks (500 feet), June 1, 1869; Appletreewick, Wharfedale, Oct. 17, 1869; Hardgap, near Stean, Nidderdale (1200 ft.), on border of moor, Sept. 2, 1870.

The Thrush and Blackbird go up to the Dale Head, at least as high as 1200 feet, where their voices tend to the wild beauty of the scene.

"Et Merulus modulans sat pulchris *tinnitat* odis,
Nocte ruente tamen cantica nulla canit."

"Lodge, May 21, 1871. The chorus of birds on this still, calm, sunny evening, 6.30 P.M., consists of the notes of the Curlew (of which a pair, wheeling about, has gone to the Nidd to drink), the Ring Ouzel, the Cuckoo, the Snipe high in air, and the Chaffinch, with his sharp 'wit, twit, twit,' while Starlings are busy with their young in the neighbouring barn-roofs.

'Tunc Turdus *truculat*, Sturnus tunc *pusitat* ore.'

7 P.M. The Thrush has only just begun to sing, and now, save for the distant Curlew, he has it all to himself. 7.30 P.M. Curlews

all around making a sweet melodious chorus; Swallows gone; Martins flying about; Starlings gone; the last warm, soft, rose-coloured tint fading and darkening on the opposite cliffs. Four distinct Thrushes singing; Partridge noisy in the dale below the house.

‘*Caccabat hinc Perdix, hinc graccitat improbus Anser.*’

A troop of clouds that came over this afternoon have all gone, but there is a haze forming.”

The Ring Ouzel has a sweet song, not unlike parts of a Thrush's. It has a beautiful note, which it repeats thrice,—not inaptly represented by the words “tree, tree, tree,”—smart, but extremely melodious. The Ring Ouzel does not ascend to the very highest hills, nor does it go below the heathery moors, and even on these is not to be seen everywhere. Its favourite haunts are broad shallow valleys with numerous running “sikes,” and having on each side a flat ridge. There the ling grows long, and its nest may be found near to some running stream. I give descriptions of four of these from nature:—

No. 1. May 13, 1869. Brimham Rocks (900 feet), in an east and west sike, on the northern side, under a tuft of heather.—Composed of sticks of heather and pieces of dry strong grass, rather loosely compacted, but strongly built, and lined with finer grass. The nest contained four eggs; light bluish green ground, mottled with dirty brown spots.

No. 2. May 14, 1869. Pateley Moor (1000 feet).—Constructed like No. 1, and exposed to the east. Three eggs.

No. 3. May 11, 1871. Moors near Kettlewell (1440 feet), in a cleft in limestone.—Made of grass, &c., lined with fine grass; internal diameter, 4 inches; outside, 7 inches. Four eggs; pale blue ground, faint blotches, pale purple and brown, thicker at upper end; length, 1·2 in.; breadth, ·9 in.

No. 4. May 22, 1871. Lodge (1075 feet), under a tuft of wood-sage in a vertical bank on a bed of sandstone.—Made of wiry roots and stems of bracken, pieces of moss and coarse grass, lined with fine grass; internal diameter, 4 inches, round. Four eggs; pale green ground, irregularly but somewhat thickly speckled with umber blotches of a pale tint, and less distinctly with pale purple, especially about the larger end; a few dark lines and dots at larger

end; length, 1.25 in.; breadth, .9 in. Nest nearly three inches deep; seven feet above stream.

The Ring Ouzel is somewhat uncertain in its appearance upon the South Downs; sometimes it will not appear for years together. On January 29th, during the present year (1879), I observed a small flock amongst some furze bushes on the downs about a mile above Michelgrove, in Sussex.

Let me record my tribute of admiration for the gentle bird, the Hedgesparrow, whose rich little canzonet may be heard on the silvery mornings of those rare bright days when an atmosphere, clear as crystal and of alpine purity and freshness, descends to invigorate the less favoured regions of the plain in bleak November.

The Redstart is quite as characteristic of the larger woods as the Grouse, Golden Plover and Ring Ouzel of the moors. It abounds in the district, and ascends to 1000 feet, perhaps higher. I have noticed it in Airedale, Wharfedale (as high as Starbott), Nidderdale, Colsterdale, and Coverdale. The Willow Wren, Redstart, and Chaffinch have a note in common—most delicately modulated and drawn out by the Willow Wren, rather more quickly repeated by the Redstart, and somewhat more coarsely by the Chaffinch, which seems to mock the Willow Wren.

There are no Stonechats in Nidderdale. On July 6th, 1869, I saw the only Stonechat I remember to have seen anywhere in the neighbourhood; that was on Constable Ridge, near Haverah Park (750 feet). The place abounds with low stunted furze-bushes.

The Whinchat is extremely common, and ascends to 900 feet; in Airedale, east of Shipley, there is not a field without several. It has a favourite note, "tooe, tuck, tuck,"—the "tooe" drawn out beautifully modulated, the "tuck, tuck" rather reedy in sound, somewhat like picking the end of a thin piece of wood with the finger. The Whinchat and Wheatear have this note in common; so great is the similarity that I question whether the most practised ear could tell by the sound alone which bird uttered the often-repeated and slightly varied "twee, chuck, chuck." They have also the same habit of flying before one along the road—a trick common to the Whitethroats, Flycatchers, and many others. Whinchats swarm along the railway between Pateley Bridge and

Dacre Banks, and Wheatears are common on the higher ground. They abound in the flat green fields of Cracoe (700 feet), near Linton in Wharfedale, where there are stone walls or iron railings, and no hedges, with a few scattered thorns. They evidently consider, with Col. Lovelace, that—

“ Stone walls do not a prison make,
Nor iron bars a cage.”

The young Wheatears arrive at the south coast early in August, where they flock during the autumn.

I have not seen the Grasshopper Warbler in the whole district, except once, about June 15th, 1869, at Garth Crook (1000 feet), on the border of the high moors of Barden Fell, between the Wharfe at Bolton and the Washburn, an exposed situation, with an easterly aspect. I have observed it farther south, near Huddersfield.

Notwithstanding the efforts of a local author to disprove the existence of the Nightingale in this district, I venture to record two localities in which I have seen these birds—Esholt Woods, in Airedale, in the summer of 1868, and on May 8th, in Jonas Wood, near Farnley Hall, Wharfedale. Nightingales usually reach the south coast the first week in August. On July 27th, 1867, I saw the first at Heene. On the 15th one was for some time on a geranium, in front of a window where I was writing, pecking the underside of the leaves. On looking to see what it could get, I found numbers of cobwebs stretched in various directions to catch the flies that might shelter there from the rain that had fallen lightly all the morning. On August 16th I saw a beautiful cock bird in the asparagus bed, of which dense forest it seems particularly fond. It runs nimbly up the perpendicular stalks, now and anon pecking on its way. It flew to a tree about thirty yards off—a straight slightly undulating flight.

I used frequently to hear the Blackcap singing through the night, in company with the Corn Crake, at Apperley Bridge and at other places in the district.

The Whitethroat occurs in Nidderdale, where its “ ee tschuk ” may be heard, but not plentifully.

The Lesser Whitethroat is by far the commonest bird in the whole district, from the vale of York up to the borders of the moors, where its place in this respect is taken up by the Titlark. It ascends Nidderdale to Angram (1200 ft.), at the Dale Head. The inclined plateaux, peculiar to the eastern slopes of the millstone-grit range,

with their small clusters of *Acer pseudo-platanus*, and frequent small ponds, afford just the conditions that suit this bird. No table land is too exposed or too elevated; provided there is a cluster of two or three trees and a pond, there will be Lesser Whitethroats. This lively bird has a loud attractive song, consisting of four notes quickly repeated, then another four a shade lower, then a third and a fourth four, thus:— ' ' ' ' After the last four the song dies away in a beautiful little trill. It has also a note like the Whinchat's, softened and modified. The Lesser Whitethroat's note has ceased by the beginning of July, when the pretty and frequently repeated trill is much missed. This bird may frequently be seen inspecting the intruder from the leafy cover of its favourite tree, *Acer pseudo-platanus*.

The Wood Wren is somewhat more local, but in suitable situations is sure to be heard. Tall trees and thick underwood, firs and *Acer pseudo-platanus*, deep sheltered "gills" with wooded sides, and large woods, are the favourite haunts of this bird; where these prevail it ascends to 1000 feet, and to the borders of the moors.

The Willow Wren ascends the dale to Angram (1200 feet); but I have no special notes about it, from which I conclude that the bird is rare here.

The Chiffchaff ranges up to little above 700 feet. The steep wooded sides of valleys and extensive woods, with tall firs and beeches, or any tall trees, are the favourite haunts of this bird. It is not so common as the Lesser Whitethroat, but considerably more common than the Wood Wren.

The Common Wren ascends to 1000 feet, perhaps higher.

The Rock Dove breeds at Guy's Cliff, and at Brimham Rocks. On May 13th, 1869, one flew out of a hole bored for more than a yard into the peat on the top of a crag amongst the Hare Head rocks. A yard from the nest I picked up two eggs, one broken, the other addled; these may have been turned out by a Cuckoo, but I had no opportunity of proving this point. The Rock Dove only lays two eggs.

On August 12th, 1871, Mr. Ormerod shot a Grey Hen on Cockley Hill (1300 feet), on the moors east of Lofthouse.

The Grouse is a capricious bird in its choice of residence. The fact that they do not abound everywhere on the moors is

doubtless not without its influence on the leases of moors. They are most plentiful in the zone between 1000 and 1500 feet, and do not go much above 1700. Spots where bilberries ripen, kept moist by springs, and with a southerly exposure, attract them in autumn, though they lie under a northern "edge" in the spring. For their nests they like broad shallow hollows with springs at the edges, and a flat ridge, at least on one side, on to which they adjourn to crow and sun themselves. "Cocklakes" is the name of one of these "Riggs" on the moors, west of the River Washburn. What a flood of beauty is shed upon the word when we learn that it means the "playing-ground"* of the moor-cock! They build also in the peat in deep-stream courses. Here is a description of two nests:—

No. 1. May 10, 1871. A light nest, beside a deep-stream course in sandstone. Made of round rushes, a few feathers mixed; $7\frac{1}{2}$ inches across. Seven eggs; pale grey, irregularly speckled and blotched.

No. 2. Same date. Deep-stream course, in peat under tuft of grass; exposure N., sheltered. Made of grass; 7 inches across. Ten eggs.

Many young Grouse are hatched before this; and it is astonishing how fast they grow, how soon they are able to fly, and how strong they are on the wing.

It has been my good fortune to spend nine successive years—spring, summer, autumn and winter—on and around the moors, and to have sat among the long heather, in the fresh spring evenings, listening to the melodious clamour of the piping birds. Here I will fall back upon first impressions, lest the picture should suffer from the rude touch of familiarity:—"May 22, 1869. On Masham Moor, a glorious expanse of heather, lying to the north of Nidderdale, 1500 feet above the level of the sea, from 6 to 8 P.M. Air resplendently clear and transparent, not a cloud to be seen; the sun lighting up the moor. Grouse calling all around, with Curlews wheeling in the air, and Golden Plovers swiftly skimming the ground; the Ring Ouzel suddenly rising on to some spray of heather, and uttering his melodious 'tree, tree, tree'; the Snipe wildly flying high in air, with his peculiar knocking noise and startled whistle—hundreds on every side, all together in full chorus. The charm of the place, with its wildness,

* Old Norsk *leika*, to play; *leikr*, a game or play.

The following summary will give an idea of the distribution of some of the birds observed in the district, and will show the various elevations at which they have been respectively met with:—

SUMMARY OF THE ORNITHOLOGY OF THE DISTRICT.

Elevation.

HIGH. MOORS.

2000 ft. Raven.

1500 „ Titlark, Buzzards, Snipe, Grouse, Golden Plover, Merlin, Ring Ouzel, Curlew.

Cuckoo, Fieldfare, Peewit.

DALES.

UPPER.

LOWER.

1200 ft. Dipper.

900 „ Sandpiper.

700 „ Heron, Whinchat - - - - - Redstart, Chiffchaff.

800 „ - - - - - Red-backed Shrike.

600 „ Redpoll - - - - - Nightjar, Nuthatch.

500 „ Pied Flycatcher - - - - - Jackdaw, Jay.

LOWLAND.

400 ft. - - - - - Corn Crake.

300 „ Sandpiper - - - - - Kingfisher.

200 „ - - - - - Sand Martin.

100 „ Dipper.

EASTERLY SLOPING PLATEAUX.

BARE.

WOODED.

1200 ft. Peewit, Swift.

1100 „ Gulls.

1000 „ Fieldfare - - - - - Lesser Whitethroat.

700 „ Stonechat, Wheatear.

600 „ - - - - - Wood Wren.

500 „ - - - - - Bullfinch.

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL,

BY JOHN GATCOMBE.

ON April 10th, wind E.N.E., several Swallows and Sand Martins made their appearance in the neighbourhood of Plymouth; and on the 13th, after snow, the wind blowing extremely cold, I observed the first Wheatear on the coast, the Common Sandpiper, and a solitary Black-headed Gull in full breeding plumage, which had not yet left us for its nesting quarters. During the remainder of the month several Manx Shearwaters were captured and brought in by our fishermen.

On May 5th there were several pairs of Turnstones and a single Knot on the Plymouth Breakwater. The Knot, although apparently an adult bird, was still in perfect winter plumage. By the 6th Whimbrels were numerous on the mud-flats. Swifts made their appearance in pairs on the 7th; and on the same day a fine young Brown Owl, almost fully fledged and nearly as large as its parents, was brought to one of our birdstuffers. Mr. Rogers, dealer in live birds at Plymouth, had three fine young Peregrine Falcons sent to him from the coast of Cornwall, and I am sorry to say that I heard of old birds having been trapped or shot during the spring, one of which came under my own inspection. A friend, writing from North Devon, a short time since, stated that a Peregrine had just carried off a good-sized young fowl which the farmer's wife was feeding in front of a farmhouse; it had also killed two and knocked down more of his own pigeons, and after having committed other depredations took its departure.

On May 9th a Great Northern Diver, in nearly perfect summer plumage, and weighing eleven pounds and a half, was kindly sent to me by Mr. Stephen Clogg, of Looe, on the Cornish coast, off which port it was hauled up—meshed and drowned, I believe—in a trammel-net three miles from the shore and from a depth of twenty fathoms, which shows the wonderful diving powers of the species. Had it lived a few weeks longer it would have completely assumed its full summer dress, which from examination I have ascertained beyond doubt is attained by a regular moult, and not by a change of colour in the feathers only, as some have supposed. The above-mentioned bird was a female, but the eggs in the ovary were not much developed, the largest not being

bigger than grains of No. 6 shot. It was very fat, and the stomach crammed with fish-bones, mixed with many small stones. I believe the breeding plumage of the females of our three species of Diver to be equal in brilliancy to that of the males, although perhaps the white spots may not be quite so large, and the same might be said of the Shag and Cormorant. On the 21st I received a further communication from Mr. Clogg, stating that two days before he had observed a pair of Black-throated Divers close by the shore, one of which appeared to be in perfect summer dress, adding that for many years before he had not seen a specimen of that species in any state of plumage.

A Ringed Guillemot was obtained during the month in the Sound, and an Iceland Gull made its appearance in our harbour, after a heavy gale from the north on May 14th, the latest date I ever remember to have noticed this bird on our part of the coast.

On June 7th some Puffins were brought in by the fishermen, and a friend told me that he had seen some lying dead on the shore at New Quay, on the north coast of Cornwall. On the 11th I visited the breeding-place of the Herring Gulls at Wembury, near Plymouth; but, although I observed several nests containing either eggs or young birds, not half the number of old ones were to be seen in comparison with former years. I have also remarked a great falling off in the numbers of both the Greater and Lesser Black-backed Gulls which annually visit our coasts in the spring. Can this be owing to the late unusually severe winter? I am sorry to say that robbing Gulls' nests is carried on to a great extent, where practicable, in Devon and Cornwall. Only a few weeks since a fine young man lost his life in trying to get at some young Gulls near the Land's End.

Swallows are very scanty with us this season, but of Swifts and Martins I think we have had about the average number. I may here mention an interesting anecdote concerning the Swallow related to me by some yachting friends, Mr. and Mrs. Cummins, residing at Stonehouse. On June 6th, when crossing the channel on their way to Jersey in the yacht 'Electra,' four or five Swallows flew on board, two of which, after having rested on deck for some time, came into the cabin, one of them actually alighting on the edge of a book Mrs. Cummins was reading, and there quietly sat looking up into her face with the utmost

confidence, Mrs. Cummins sitting perfectly still, talking to it, and, as she expressed it, only wishing the pretty little creature could talk too, tell her from whence it came, and understand that it should receive no harm. After awhile, thinking that the little voyagers must be hungry, but not knowing the kind of food they required, she at first tried them with crumbs, but finding these were not eaten, she caused some meat—ham, I believe—to be cut into small thin strips, so as to resemble worms as much as possible, and put into a basin of water, thinking by that means to tempt them to eat, but of course without avail. They remained on board for several hours, ultimately making their appearance on deck, and, finding the vessel to be in sight of land, took their departure, first hovering two or three times round the yacht by way of farewell, and then making straight for the coast, their kind friend wishing them “God speed.”

On August 9th Curlews returned to our mud-flats from their breeding-places, and flocks were constantly heard passing over the town by night. The last Swift observed by me was on the 7th; and by the 25th I saw numbers of Turnstones, Dunlins, and Ring Plovers on the Laira mud-banks; also many Yellow Wagtails, both old and young birds, in the adjacent meadows.

Captain H. Hadfield, in the last number of ‘The Zoologist,’ mentions the early appearance of Wild Geese passing over the Isle of Wight on June 30th. On July 14th a flock of these birds, seventeen in number, flew over Cannington, in Somersetshire, in a north-westerly direction.

OCCASIONAL NOTES.

PINE MARTEN IN LINCOLNSHIRE.—It may interest some of your readers to learn that a female Marten has been trapped in a wood near here, and, being now a very rare animal in this part of the country, has been preserved. I understand this is only the second instance of the occurrence of this species in Lincolnshire within the last twenty years.—CHARLES WINN (Appley Hall, Brigg).

[Our correspondent having been so good as to forward the specimen for our inspection, we are able to state that it is the Pine Marten, and not the Beech Marten, as he at first supposed. In ‘The Zoologist’ for 1877 (p. 251) the Rev. A. P. Morres has recorded the death of a Marten-cat in

Lincolnshire (in a wood called South Wood, once noted for Martens, belonging to Mr. Thomas Drake, of Stainfield Hall), but the species was not ascertained, or at least not stated. Perhaps this is the second specimen alluded to by Mr. Winn. But a Pine Marten was trapped in the parish of Riley, North Lincolnshire, in 1865, as recorded by Mr. Cordeaux (Zool. 1866, p. 242), who refers to it as the second captured in that locality.—ED.]

WHITE-BEAKED DOLPHIN AT YARMOUTH.—On the 25th August last I saw on the beach at Yarmouth a very beautiful White-beaked Dolphin, *Delphinus albirostris*, which had been captured by some fishermen in their nets the previous night. In form and coloration it very closely resembled Mr. Clark's specimen taken at Lowestoft in March, 1876, and described and figured in the 'Proceedings of the Zoological Society' for that year (p. 686). Although of the same sex (female) and length, it differed in form very considerably from the Grimsby specimen figured with Mr. Clark's, being much more slender. I regret I made no vertical measurements for comparison with Mr. Clark's, but the following measurements of lengths very nearly correspond with those of the Grimsby specimen:—

	Feet.	Inches.
Total length from anterior edge of upper lip to notch in middle of caudal fin (in straight line) - - - - -	4	3
From upper lip to anterior edge of dorsal fin (along curve) - - - - -	2	1
From anterior edge of dorsal fin to notch in caudal fin (along curve) - - - - -	2	5
Base of caudal fin - - - - -	0	8½
Vertical height of caudal fin - - - - -	0	6½
Pectoral fin from junction with the body to tip along anterior edge - - - - -	0	11½
From anterior edge of upper lip to angle of the mouth - - - - -	0	6¾
From upper lip to anterior edge of blow-hole (along curve) - - - - -	0	9½
From upper lip to anterior corner of eye - - - - -	0	8½
From point to point of the flukes of the caudal fin - - - - -	1	0

Dental formula, $\frac{2}{1} \frac{6}{1} \frac{2}{1}$. Several of the front teeth had not pierced the gum.

Sex, female. Said to have weighed 110 lbs.

Three were said to have been seen together, one larger and the other slightly smaller than the one captured. The close agreement in colour and form of the Yarmouth specimen with that described and figured by Mr. Clark, although of opposite sexes, is very interesting; but a good figure of the adult animal is still a desideratum, that by Van Beneden (which I have not seen) not being considered satisfactory by Dr. Cunningham, and that by Miss Brightwell—making every allowance for difference of age—being obviously incorrect. Knowing Miss Brightwell's reputation as an artist, and the accuracy with which her figures of microscopic animals for

her father were made, I was very reluctant to form this conclusion. The skull of Mr. Brightwell's specimen is not in the British Museum, as stated in the Museum 'Catalogue of Seals and Whales,' but in the Norwich Museum. The error arose, as the late Dr. Gray explained to me, from his being under the impression that it was sent to him for the National Collection, whereas he was subsequently requested to return it to Norwich. I hope to place the skull of the present example also in the Norwich collection.—THOMAS SOUTHWELL (Norwich).

FULMAR PETREL BREEDING IN THE ISLE OF FOULA.—The announcement by Mr. Garriock (p. 389) that this species has adopted a breeding station in Shetland is so very interesting, that it may not be out of place to draw further attention to the subject, more especially as a similar occurrence took place in the Færoe Islands about 1839. In the year 1849 the late Mr. John Wolley visited the latter group, and in a paper read at the meeting of the British Association held in Edinburgh, 1850, and subsequently published by Sir William Jardine, 'Contributions to Ornithology,' 1850 (pp. 106—117), thus referred to the appearance of the Fulmar Petrel as a breeding species in the Færoe Islands:—"I have to record a very interesting fact with respect to the Fulmar, *Procellaria glacialis*, which has recently adopted some of the cliffs of the Færoe Islands as a summer station. In the time of Landt, who wrote in 1799, it was only known to those who fished far from the shore, but somewhere about the year 1839 it was observed by the rock-climbers breeding, for the first time, near Quelboe in Suderoe, and it has since much increased, and is scattered over several spots on the west cliffs of the islands of Skuoe and Great Dimon; in the latter place, the cliff in which it builds is of great height and quite perpendicular, and the ledges are very small and bare. Eight or ten of the nests that I examined consisted of a few small fragments of rock lining in a slight depression. The featherless abdomen of the bird is hollowed into a perfect egg-cup shape during the incubation, so that the single large egg has the warmth applied to it in the most effectual manner. I will not attempt to speculate on the reason of this remarkable change of locality in a bird supposed to be so constant in its attachment to certain breeding places. It is not found in Shetland or Orkney. St. Kilda is perhaps its only British, and also its most southern, station. It is, however, said to breed on the island of Barra, perhaps not South Barra, but Bara and Rona, two rocks far to the north of Cape Wrath and the Lewes, whose position was ascertained with accuracy in one of Parry's Arctic Voyages." Sir Edward Parry's observation, referred to by Mr. John Wolley, was taken on the 31st May, 1824, on his outward voyage to the Arctic Regions, in H.M. ships 'Heckla' and 'Fury,' and the west end of Bara is placed by that distinguished navigator in

latitude $59^{\circ} 06' 45''$, longitude $6^{\circ} 11'$. For a most interesting account of the various out-lying rocks of the west coast of Scotland and their feathered inhabitants, I must refer the reader to Captain Elwes' admirable paper on the "Bird-stations of the Outer Hebrides" ('Ibis,' 1869, pp. 20—37). This naturalist did not find the Fulmar breeding on Berneray (Barra Head) or other of the south isles of Barra in 1868, and in 1870 Mr. Harvie Brown and I met with similar experiences. Mr. Robert Gray ('Birds of the West of Scotland,' p. 499) records the interesting fact that the Fulmar bred in the south isles of Barra as late as 1844, since which date it has not been observed in those localities during the breeding season. Under ordinary circumstances I should not venture to question a statement published under the sanction of such an eminent authority as my friend Mr. Robert Gray, and indeed it is not my intention to do so now, but merely to point out that John Wolley, writing in 1850, seemed to accept with some hesitation the fact of the Fulmar breeding in South Barra. For my own part I do not consider it more extraordinary that this species should vacate old established breeding haunts than that it should adopt new ones; but it shows that the Fulmar is not so attached to certain breeding stations as used to be supposed. It would be interesting to find out about what date the Fulmar made its appearance as a breeding species in Skye, or whether it has always been recognised as such by the inhabitants of that island. *Procellaria glacialis*, as recorded by me in 'The Zoologist' for 1872, has greatly extended its breeding stations in the Færoe Islands since 1839, and since Wolley's visit in 1849, for in 1872 I found it breeding on Suderoe, Great Dimon, Skuoe, Mygenaes, Videroe, and Fugloe, or, in other words, throughout the group.—H. W. FEILDEN (Aldershot).

LATE STAY OF SWIFTS.—The late stay of Swifts during the present autumn has been the subject of general remark by naturalists throughout the country. Up to the present time (Sept. 25th) I have received reports of Swifts being seen at the following places on the following dates:—

- Aug. 20. Between Redcar and Teesmouth, "in thousands."
- „ 21. Loch Tay; Redcar and Teesmouth; only two or three remained.
- „ 22. Whitby.
- „ 23. Near Hartlepool.
- „ 25. Budleigh Salterton.
- „ 26. Withernsea, Yorkshire; and Lymington, Hants.
- „ 27. Darlington, flying S.W.; between Redcar and Teesmouth, "another immense flight."
- „ 28. Between Redcar and Teesmouth, "about a dozen"; others at Yarmouth.
- „ 29. Darlington, flying W.; Spurn Point; Landerfel, near Bala; and Ryde, Isle of Wight.

Aug. 30. Between Redcar and Teesmouth, "a few"; Flamborough Head, "scores."

„ 31. Between Redcar and Teesmouth; and at Ipswich.

Sept. 1. Teesmouth, ten or twelve, "none seen here afterwards"; and Bedford, "several."

„ 2. Scarborough; Masham; Uttoxeter; and Hornsea Mere, "hundreds."

„ 3. Bridlington Quay; and Ipswich, flying S.

„ 6. Grantown-on-Spey; Riccal Common, near Barnsley; and about the Abbey Church, Selby, Yorkshire.

„ 7. Loch Tay; and Worcester.

„ 8. Remony, Loch Tay; Glenisla, near Alyth; and Gt. Chesterford.

„ 10. Penarth, "two"; and Castle Lough, Killaloe, Tipperary.

„ 12. On the Waveney, near Lowestoft; Great Cotes, Ulceby; and Ryde, Isle of Wight, "a solitary bird."

„ 15. A single bird, over the River Wharfe, near Wetherby, Yorkshire.

In the marshes of North Lincolnshire, during the past summer, Mr. Cordeaux has remarked how much higher than usual the Swifts have flown when hawking for food; showing that, notwithstanding the cold, wet, and ungenial weather, and the constant occurrence of heavy rains, the small insects they seek must have taken to a higher level, and been especially abundant in the upper regions of air. The why and the wherefore of this he leaves to meteorologists. It is doubtless in some manner connected with a peculiar state of the atmosphere, and the amount of moisture with which it is charged.—J. E. HARTING.

ATTEMPTED INTRODUCTION OF THE NUTHATCH INTO IRELAND.—In reply to your letter of enquiry about my attempt to introduce the Nuthatch into Ireland, I am sorry to say that I have not been very successful in my experiments. In the summer of 1877 Mr. Borrer, of Cowfold, Sussex, gave me seven young birds. I reared and sent to Ireland five of these, but unfortunately, the second or third day after their arrival, four died quite suddenly. They seemed perfectly well in the evening, but early the following morning my keeper found them dead in the bottom of their cage. Last year (1878) Mr. Borrer gave me eleven more young birds. Of these the keeper to whom I entrusted them at the Zoological Gardens, only succeeded in rearing two, which lived well and quietly together in the same cage until last January, when, without any previous warning, one set upon and killed the other. I was thus left with one bird from each year, and these I turned out last spring, but I do not know whether or not they are a pair. On the receipt of your letter I wrote to ask my keeper whether he had seen them since, and I have only just received his answer to say that he had never seen the birds after they were turned out. I am not much

surprised at this, as the woods here are large, and my keeper has been very busy rearing pheasants; but if they have remained about the place they ought to show themselves during the autumn and early winter. A great deal of my wood is a natural growth of holly, hazel, and oak, which I think ought to suit the Nuthatch. There are also a good many ants, but they do not form regular ant-hills, and I have tried and failed to introduce the large wood ant. I have now, through the persevering kindness of Mr. Borrer, four fine young birds, which I hope to take with me to Ireland next week; but I am a little doubtful what to do—whether to turn them out this autumn or to keep them until the spring. My experience with the Nuthatches—and not with them only, for I have tried Hawfinches, Crossbills, Blackgame, and Capercaillies—shows the great difficulty of trying to introduce any birds into strange localities. I believe, however, that the chief obstacle to success is the difficulty of getting a sufficient number to allow for casualties. Nothing but the interest Mr. Borrer has shown in the experiment has enabled me to give the Nuthatches a fair chance; for I find it next to impossible to purchase any of our less common birds. I have tried for a long time to buy a few Spotted Woodpeckers, but without success, although I have given commissions to several of our London bird-fanciers. I shall be happy at any time to give you information as to how I am getting on with my various experiments, which are not confined to birds, for I am now trying to establish some foreign moths.—EDWARD H COOPER, Lieut.-Col. (Markree Castle, Collooney, Co. Sligo).

NESTING OF BLACKGAME IN WOLMER FOREST.—To show the difficulties attending the increase of Blackgame at Wolmer, I find, on reference to my notes, that a nest of nine eggs was ruthlessly taken by boys in charge of cattle grazing on the Government ground on the 1st June, 1878, and no direct evidence of the robbery established; while out of a nest of seven eggs examined by Capt. Feilden and myself on the 13th of the same month only two eggs proved fertile, five addled ones being left in the nest! Whether this latter lamentable failure was due to the cold wet weather prevalent at the time, or to the well-known preponderance of male birds, I am unable to say. It serves, in any case, to account for the fact that there is no marked increase in the number of Blackgame in the Forest, in spite of all restrictions and strict preservation of the Grey-hens.—S. G. REID (Capt. R.E.).

DISCOVERY OF THE EGGS OF THE CURLEW SANDPIPER.—In 'The Ibis' for July Dr. T. M. Brewer, of Boston, thus announces the discovery by an American naturalist of the egg of the Curlew Sandpiper, *Tringa subarquata*, hitherto unrepresented by authentic specimens in any collection:—"Mr. Ludwig Kumlien, Naturalist to the Expedition sent to the Cumberland Region, was so fortunate as to find the Curlew Sandpiper breeding in

North Greenland, near Christianshaft, in the summer of 1878. He mentions the species as not uncommon. Several eggs were procured, through the attentions of Governor Fencken. Two examples of the eggs were brought home by Mr. Kumlien; and these are now in the collection of the Smithsonian Institution. During a recent visit to Washington I availed myself of the opportunity to examine these specimens; and from the notes then taken I send you the following description:—One of these eggs measures 1·52 inch in length by 1·05 inch in its greatest breadth. Its ground colour is thickly marked with blotches of two shades of umber-brown; one of these shades is quite light, the other much darker. These are most numerous on and around the larger end, and are in a somewhat longitudinal direction, with a tendency also to a spiral course. There are also a few spots of a very dark (almost black) colour on the larger end. The other egg measures 1·47 inch by 1·04 inch, and is of a much more pyriform shape. Its ground colour is very light greenish drab, with rather sparse markings of a deep umber. The markings are larger and more confluent about the greater end of the egg, where they are chiefly disposed in a circular ring. The rest of the egg is sparsely marked with the same. About the larger end are a few very dark markings. The two eggs, as you will notice, differ somewhat in their shape, and present also something of a contrast in their ground colours." So far as one can judge by the description given, these eggs appear to be very similar in colour and markings to those of the Dunlin.—J. E. HARTING.

GREEN SHAG IN NORTHAMPTONSHIRE.—A young bird of the above species was caught whilst asleep upon a pinnacle of the towers of Arthingworth Church, near Market Harborough, on August 31st, and brought to me alive and uninjured. This is not the first occurrence of this species in this county which has come to my knowledge, but strikes me as worthy of record, as I believe the Green Shag to be an uncommon bird upon our eastern coasts.—LILFORD (Lilford Hall, Oundle).

MANX SHEARWATER IN NORTHAMPTONSHIRE.—A Manx Shearwater, *Puffinus anglorum*, was shot on the River Nen, near Titchmarsh, on the evening of September 4th, by my friend and neighbour, Mr. G. E. Hunt, who sent it to me. As in the case of the Green Shag above recorded, I know of a previous occurrence of this species in our county; but the weather that can drive such a hardy sea-rover as a Shearwater some forty miles inland at this time of the year is certainly very exceptional.—LILFORD (Lilford Hall, Oundle).

HOBBY AND COMMON SCOTER IN BEDFORDSHIRE.—Mr. Covington, taxidermist, of this town, has shown me a male Hobby which was shot near Bedford at the latter end of July. I hope, in recording this capture for the benefit of future faunists, I shall not lay myself open to the charge of

“pandering to the vanity of its destroyer” (*cf.* Zool. 1878, p. 76), for I much regret its destruction. Mr. Wright, of Clifton, near Biggleswade, informs me that he has in hand “a male specimen of the Black Scoter, *Ædemia nigra*, which was shot on the 19th August, by Mr. Hare, of Compton Mills, near Shefford.” I fancy this is a most unusual date at which to meet with a Scoter in this part of England.—C. MATTHEW PRIOR (Bedford).

TAWNY OWL NESTING IN A BURROW.—In regard to its nesting habits, the Tawny Owl seems to differ a good deal from other Owls. As a rule, the eggs are deposited in the hole of some tree, but it has been observed to make an open nest in a hollow of a fork, seven feet from the ground, and sometimes to make use of the deserted nest of a Rook (see Gray’s ‘Birds of the West of Scotland,’ p. 61). It has also been known to lay its eggs upon the ground on a heap of fir-needles (‘Ibis,’ 1866, p. 324). In ‘The Ibis’ for July last (p. 378) two instances are recorded of its nesting in a burrow. Capt. J. W. P. Orde mentions a nest of five eggs so placed which came under his observation in Argyllshire. One had rolled away into a branch of the burrow, the others were nearly hatched in the second week of April. Mr. Bruce, of Ederline, at the foot of Loch Awe, on April 18th, 1876, found a nest of this bird in a rabbit-hole, about two feet deep in a sloping bank. The nest contained four young Owls differing greatly in size; two were at least ten days older than the other two, and no two of them looked quite of the same age; they were covered with whitish down, and kept their eyes shut. The nest also contained a rat and two mice, freshly killed, and with their heads taken off. This approximation in habit to the well-known burrowing Owls of America is curious and worth noting.—J. E. HARTING.

COMMON SCOTER IN NORTHAMPTONSHIRE.—A female of this species, *Oidemia nigra*, was killed near Woodford Mill, on the River Nen above Thrapston, and sent to me, in the flesh, on August 20th. I consider this occurrence worthy of record, not only because it is the first appearance of the species in this neighbourhood which has come to my knowledge, but also on account of the unusual time of year for the visit of such a sea-loving bird to an inland locality.—LILFORD (Lilford Hall, Oundle).

GREY WAGTAIL GREGARIOUS AT ROOSTING TIME.—At p. 391 of ‘The Zoologist’ for 1878, Mr. H. Chichester Hart observes that he noticed on one occasion a number of Grey Wagtails congregated together at roosting time in some reed-beds in Ireland. As this seems to be a newly recorded fact in Ornithology, I have much pleasure in stating that quite recently (September 4th) I have frequently observed small parties of Grey Wagtails, consisting of a score or so of individuals, resorting to the reed-beds by the Ouse as soon as it begins to get dusk. At this time of year this species is very abundant here.—C. MATTHEW PRIOR (Bedford).

DESTRUCTION OF WOOD PIGEONS IN SCOTLAND.—Speaking at the Central Banffshire Farmers' Club on the 15th August, Viscount Reidhaven said:—"I daresay some of you will remember some years ago, when I had the pleasure of addressing you in Mr. Longmore's hall, that I ventured to suggest the getting up of an association for the destruction of Wood Pigeons. However, that fell to the ground; but I wish to read to you a few returns showing that my father did not forget about the Wood Pigeons. I will read you the returns of what has been done at Cullen House between 1876 and 1879. In 1876, 1256 eggs were destroyed. In 1877, 1172-old Pigeons, 1033 young Pigeons, and 6593 eggs were destroyed, making a total of 8798. In 1878, 1320 old birds, 446 young birds, and 5946 eggs were destroyed, making a total of 7712. In 1879, 804 old birds, 424 young birds, and 1399 eggs were destroyed, making a total of 2327. Besides these, there were killed by my father and shooting friends 436 old pigeons during two seasons. My father gives so much money to anybody who brings young or old birds or eggs, and the amount of money which he had expended in this way from 1876 to 1879 has been £117 13s. 3d. The total number of birds and eggs that have been destroyed altogether during these years has been no less than 20,529."

CURIOUS DEATH OF A MOORHEN.—From the last 'Annual Report and Proceedings of the Belfast Naturalists' Field Club,' obligingly forwarded by the Secretary, we learn that at one of the meetings Mr. Thomas Darragh brought under the notice of the members a Moorhen which had been brought to him for preservation. This bird was found dead on the banks of a small pond in the neighbourhood of Richmond, on the Antrim Road. When found it was still warm, and it did not appear to have been killed by violence. Curious to know the cause of death, Mr. Darragh made a careful examination, and found, on dissection, that death had resulted from the presence of several small annelids, apparently leeches, one of which he found firmly adhering to its lungs, another to its liver, and two almost embedded in its kidneys. The only way he could account for their presence in the viscera was by supposing they had entered by the windpipe, pierced the lung, and found their way to the other parts of the body. It was stated that the pond near which the bird was found is supplied by the overflow water of the town basin, and that it was a matter worthy of serious consideration whether or not these dangerous annelids were derived from that source; and if so, whether there is any possibility of their reaching the water-cisterns, and causing fatal results to the ratepayer who may unconsciously imbibe a few. The specimens, which are upwards of three inches in length, were exhibited, and Mr. Darragh, on the suggestion of the President, promised to hand them to a competent authority for examination.

ADDER TAKING POSSESSION OF A NEST.—Looking over last year's notes, I recently came across the following, which I intended at the time to send for publication in 'The Zoologist,' but which, in the hurry and scramble of a change of quarters from Aldershot to Ireland, found its way to the lowest depths of a portmanteau instead of the pages of that welcome periodical:—"June 4, 1878. Warder Ford reports a strange incident. He was at Fleet Pond, and seeing an Adder lying coiled up in the thick herbage at the foot of a bush at the water's edge, he struck at it with a thick stick and killed it. To his astonishment, the blow also knocked a young Reed Bunting, *Emberiza schæniclus*, out of a nest on which the Adder had been lying, fortunately doing it no injury. It turned out that the reptile had coiled itself up—probably already gorged by a previous heavy meal—on the top of the Bunting's nest, containing four young birds, like a veritable dog in the manger, waiting till its appetite returned before devoting its gastronomic energies to the consumption of its victims." It is satisfactory to know that the whole of the brood safely left their nest in due time.—S. G. REID (Capt. R.E.).

BOAR-FISH ON THE DEVONSHIRE COAST.—The shore on the western side of Plymouth, on August 12th, was strewn with Boar-fish, *Capros aper*. I asked some fishermen; who were drawing a seine for Mackerel, whether they had caught them; but they said that they were caught by the trawlers in the channel, who in coming into Plymouth threw them overboard when turning out their nets, and as there was a strong easterly wind blowing at the time it accounted for so many being driven on the western shore. I should say there were more than a thousand of them, and almost all of the most beautiful colour, some quite crimson, others more scarlet or pink; but all more or less beautifully banded or striped. I found, however, that these bands soon faded or disappeared altogether on being exposed to the light and air. They had a peculiarly strong fishy smell, and their very small scales were exceedingly dry and rough to the touch. The construction of the protruding and retractile snout is very curious. On asking the fishermen, out of curiosity, what they called them, they one and all answered "Cuckoo-fish"; but I think what is generally by fishermen called by that name is the Cook Wrasse, and sometimes one of the Red Gurnards.—JOHN GATCOMBE (Durnford Street, Stonehouse).

THE OCCURRENCE OF LEPTODORA IN ENGLAND.—At the recent meeting of the British Association at Sheffield, Sir John Lubbock, in the Department of Zoology and Botany, called the attention of the Section to the occurrence in England of *Leptodora*, a very interesting crustacean

first found in deep lakes abroad, and more recently in a reservoir near Birmingham. Like many marine organisations it was as transparent as glass. This rendered the creature less conspicuous to its foes. Like other animals of the same group it laid two kinds of eggs. The young at first were quite unlike their parents, so unlike that they were thought to be a distinct species. Sir John then gave a description of this little animal, and, by means of sketches, illustrated the peculiar functions of the different organs, pointing out the difference of the organs in male and female.

INSECTS WHICH INJURE BOOKS.—At the recent meeting of the British Association, at Sheffield, Prof. Westwood, in the Department of Zoology and Botany, read a paper "On the Insects which injure Books." Referring to an address delivered by Dr. Hagen, on July 2nd, 1878, before the American Library Association, on the same subject, Prof. Westwood passed in review the life-history of the different species of insects which have been found to destroy books and printed papers, several of which were not noticed by Dr. Hagen. The caterpillars of the moth *Aglossa pinguinalis*, and also of a species of *Depressaria*, often injure books by spinning their webs between the volumes and gnawing small portions of the paper with which to form their cocoons. A small mite, *Cheyletus eruditus*, is also found occasionally in books kept in damp places. A very minute beetle, *Hypothenemus eruditus*, forms its tiny burrows within the binding of books. *Lepisma saccharina* also feeds on paper, of which a very curious example was exhibited of a framed and glazed print of which the plain paper was eaten, whilst the parts covered by the printing ink were untouched. White ants (*Termitidæ*) are a constant source of annoyance in warm climates; and Prof. Westwood also noticed the ravages committed by the cockroaches, *Blatta orientalis*. The insects that do the greatest injury are *Anobium pertinax* and *A. striatum*, commonly known as the "death watches," burrowing through the books, even, it is recorded, drilling through twenty-seven folio volumes. Various remedies for the destruction of these insects were mentioned and especial notice was directed to a 'Report of the Commission appointed to inquire into the Decay of Wood-Carvings, and the Means of Preventing and Remedying the Effect of such Decay,' issued by the Science and Art Department in 1864. Prof. Westwood then detailed the various remedies proposed, as washing with solution of corrosive sublimes in alcohol, exposing the books to the vapour of benzine, or carbolic acid, or hydrocyanic acid, or fumigating with burning sulphur. Placing the volumes under the exhausted receiver of an air-pump for an hour has also been found successful by Dr. Hagen.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

August 6, 1879.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Mr. Phillips exhibited living specimens of both sexes of *Spercheus emarginatus*, taken at West Ham.

Mr. Stainton exhibited, on behalf of Mr. Grigg, of Bristol, larvæ of *Röslerstammia Erælebella*, a genus of which the larvæ had hitherto been unknown. These were obtained from lime trees near Bristol, feeding externally on the leaves, quite exposed. They were very transparent, showing the whole of the interior of the larvæ, and with the segments deeply incised. When full-fed they turned down the edge of the leaf and spun the cocoon within the fold thus made, just like the larvæ of the genus *Ornix*.

Miss Ormerod read a paper entitled "Sugar-cane Borers of British Guiana," and exhibited specimens of the insects referred to in different stages of development. The first—a moth stated to be a *Proceras* (sp.?)—was the most destructive, and the other insects were Coleopterous belonging to the genus *Calandra*—*C. sacchari* and *C. palmarum*. Miss Ormerod made the exhibition on behalf of the Colonial Company, who were anxious to receive any information as to available and practical methods of dealing with these attacks.

Mr. W. L. Distant stated that these insects had long been recorded as destructive to the sugar-cane in the West Indies, and that the circumstances were almost the same on the plantations in the Straits Settlements at Malacca, where the usual remedy, and possibly the only one, was searching for and burning the infested canes, thus gradually diminishing, and possibly eventually to a great extent extirpating, these destructive insects.

Mr. Swinton contributed the following note:—

"At page xii. of the 'Proceedings of the Entomological Society of London' for 1877, contained in the third issue for that year, I find the following observations recorded:—'Mr. Meldola stated that . . . the larva of *Liparis auriflua*, which feeds upon hawthorn, sloe, apple, oak, &c., and which possesses the well-known property of "urticating," could be adduced as an example of a larva feeding on non-poisonous plants, and yet elaborating poisons by chemico-physiological processes.' Mr. M'Iachlan remarked that the received opinion, on the other hand, was that 'the urticating property was due to mechanical irritation, the numerous brittle hairs of the larva

entering the skin.' Mr. Dunning and Mr. Waterhouse raised the question whether the hairs thus penetrating the skin might not possess some poisonous quality.

"On the penultimate and ante-penultimate segments of the Gold-tail Moth, *Liparis auriflua*, will be seen dorsally two scarlet conical and truncated tubercles, which superiorly present a keyhole-shaped orifice. These when the caterpillar contracts its tubercles, which it does in the fashion of a sea anemone, enlarge by the constriction to a triangular shape, and a colourless liquid wells up to their rim. A pencil-point dipped in this and applied to the cheek or eyelid will at once renew the said burning sensation, and leave little doubt as regards the caustic property of the fluid. The larva then in this instance poisons its lances, and if a magnifying power be applied, the drops of moisture conglobing on the hairy armature are revealed to view, squirted from the hinder craters, by constriction we may presume, since touch immediately produces a contraction in the hinder segments of the caterpillar."

The following communication was received from Mr. R. M'Lachlan:—

"In the 'Comptes Rendus,' of the Belgian Entomological Society of the 5th July (1879), is a notice by M. Mélise on the subject of correlation of mutilation in the larva with deformity in the imago. M. Mélise operated upon ten selected silkworms by cutting off the right metathoracic leg of each. All went through their transformations, and the operation caused, apparently, little inconvenience, for they recommenced feeding almost immediately afterwards. The effect on the moths produced from these larvæ was as follows:—One was deprived of three tarsal joints, but the claw was developed. Three were deprived of three tarsal joints, and of the claw also. Three had only the femur and tibia. One had the leg 'amputated' in the middle of the femur. The two others had only a stump, scarcely a millimètre in length. M. Mélise adds that in not one of the moths was the leg absolutely absent, and that the variation in the amount of deformity probably resulted from the difficulty of performing the amputation in the larvæ at precisely the same place in each. In the case of insects with incomplete metamorphoses parallel experiments have often been made, and with similar results; but with Lepidoptera they have been so few as to render confirmatory evidence of the statements of other experimenters of much value."

Part II. of the 'Transactions' for 1879 was on the table.—R. MELDOLA,
Hon. Secretary.

THE ZOOLOGIST.

THIRD SERIES.

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[No. 35.]

ON SOME LITTLE-KNOWN HABITS OF THE WOODCOCK.

BY THE EDITOR.

NOT many years ago it was currently believed by sportsmen that no Woodcocks remained in the British Islands after the end of winter, except perhaps a few wounded birds, which were unable to cross the sea to their usual breeding-places. Nor is this notion yet altogether exploded, so difficult is it to controvert preconceived ideas which have once firmly taken hold of the public mind.

It is, of course, perfectly true that the greater proportion of the Woodcocks which are found here by sportsmen during the shooting season are winter visitants, which arrive in October, and which, if not killed, would leave the country again in March or early in April. But it is equally the fact that a large number of Woodcocks annually remain here to pair and nest in suitable localities.

Mr. A. G. More, in his valuable remarks in 'The Ibis,' "On the Distribution of Birds in Great Britain during the Nesting Season," observes that the nest of the Woodcock is by no means so rare as is generally supposed. The bird is reported as breeding occasionally in nearly every county throughout England and the South of Scotland. Farther north it becomes more numerous, and may be considered to breed regularly from Perthshire

northwards to Caithness.* There is no doubt that many more birds remain to breed now than formerly; and this increase appears to be owing to the great extent of country which has been covered with plantations during the past few years, particularly, according to St. John, with fir plantations.†

What reason, asks Selby, is to be assigned for this change in their habits? Is it to be attributed to a change in our seasons, or are we to look for it in the great increase of woods or plantations, so general over all the island, affording these birds additional and secure retreats, as well as an abundant and constant supply of food?‡ The late Sir William Jardine attributed the circumstance to the increased attention paid to Ornithology, and to such facts being recorded; he could not perceive any change in the country to induce the birds to remain more frequently than heretofore.§ Another reason may be found in the circumstance that now many owners and lessees of manors do not allow their coverts to be disturbed in the spring, and give orders to their keepers to spare the Woodcocks after a certain date.

Mr. T. Monk, of Lewes, some years since was at considerable pains to obtain statistics as to the number of Woodcocks remaining to breed in the eastern division of Sussex; and, extraordinary as it may appear, the conclusion he arrived at was to the effect that in seven districts of East Sussex, comprising twenty-one parishes, there were annually, on an average, from one hundred and fifty to two hundred nests of this bird.||

It is not, however, with the question of nesting that we are now concerned, but with the singular habit which this bird has of carrying its young under certain circumstances—a habit which has been placed beyond doubt by the testimony of many competent observers, and which has been very beautifully depicted by Mr. Wolf in the accompanying illustration. The observation of this habit is by no means new. Scopoli, in his '*Annus Primus Historico-Naturalis*,' long ago remarked upon it, and several

* Mr. More might also have added Ireland, since several instances of the Woodcock breeding there are mentioned by Thompson (vol. ii., p. 247), and many others have since been recorded.

† '*Wild Sports and Natural History of the Highlands*,' p. 264 (ed. 1878).

‡ '*Mag. Zool. and Bot.*,' i. p. 201.

§ '*British Birds*,' iii. p. 171 (Naturalist's Library).

|| The statistics collected were subsequently published in '*The Field*' of 25th February, 1871.

writers since his time have discussed the subject. Gilbert White, on reading Scopoli's statement "*pullos rostro portat jugiens ab hoste*," was incredulous. "But candour," he added, "forbids me to say absolutely that any fact is false, because I have never been witness to such a fact. I have only to remark that the long unwieldy bill of the Woodcock is perhaps the worst adapted of any among the winged creation for such a feat of natural affection." Had Scopoli omitted the word "*rostro*" his statement might have been less open to criticism, the fact being that not one of the subsequent observers who have confirmed his assertion that Woodcocks *do* carry their young agrees with him that they are carried *in the bill*. Nor do they upon this point agree amongst themselves.

The late L. Lloyd, in his 'Scandinavian Adventures,' wrote, "If in shooting you meet with a brood of Woodcocks, and the young ones cannot fly, the old bird *takes them separately between her feet*, and flies from the dogs with a moaning cry." Again, in his 'Game Birds and Wildfowl of Sweden and Norway' (p. 194), he thus refers to the habit as observed by a friend:—

"'Once during a hare-hunt,' writes my friend, M. Anders Oterdahl, 'I myself shot a Woodcock, flushed by the dogs, and when flying at about six feet from the ground, that was bearing an unfledged young one *in her claws*. It seemed to me she grasped it with her feet, one foot having hold of one wing and the other foot of the other. Though, owing to intervening branches, I did not observe the old bird when she rose, I was fortunately so near to her as clearly to see what I have stated. Afterwards I found two other young ones under a neighbouring bush, where they had retreated for safety.' When the above story appeared in my former work, 'Scandinavian Adventures,' it was looked on by many, both in Sweden and England, as a fable: but, from the number of similar instances since recorded, it is now, I believe, received as an admitted fact in both countries that Woodcocks, when their young are in jeopardy, not unfrequently thus convey them to a place of safety."

One of the brothers Stuart, who, in the second volume of the 'Lays of the Deer Forest,' have given such a graphic account of the wild animals of Scotland, from personal observation of their habits, thus refers to the bird now under discussion:—

"The Woodcock breeds to a considerable extent in most parts of the forest, and also in other woods of Morayshire, the Aird of Inverness, and on the Dee, the Don, the Spey, and other parts of the Highlands, but,

within our knowledge nowhere so numerous as in Tarnaway. Without any search, and merely in the accidental occasions of roe-hunting, we have found, in one season, nineteen nests with eggs. It would, however, be more proper to say 'beds,' rather than 'nests'; for, like those of the Plover, they are merely slight hollows formed by the nestling of the bird's breast in dry soft spots, or on the fallen leaves. They generally lay three eggs, sometimes four, and occasionally, but rarely, five, and never that we have known beyond that number. The eggs are surprisingly large in proportion to the bird, and of a brown colour, variegated, like the young, with beautiful clouded tints. Like all the larger ground-birds, they run as soon as they are hatched, which is early in the spring; and in May I found a brood of five, so large that I could only catch the smallest, and that with difficulty. As the nests are laid on dry ground, and often at a distance from moisture, in the latter case, as soon as the young are hatched, the old bird will sometimes carry them *in her claws* to the nearest spring or green stripe. In the same manner, when in danger, she will rescue those which she can lift. Of this we have had frequent opportunities for observation in Tarnaway. Various times, when the hounds, in beating the ground, have come upon a brood, we have seen the old bird rise with a young one *in her claws*, and carry it fifty or a hundred yards away; and, if followed to the place where she pitched, she has repeated the transportation until too much harassed. In any sudden alarm she will act in the same way. One morning I had been sitting for some time on the grey stone of the 'Braigh-clach-liath,' ruminating with my eye fixed unconsciously on the ground, at the dry leafy foot of a cluster of those tall slender birches which, at that time, formed one of the most beautiful features of the terrace: as my thoughts became less intense, and the mind had exhausted its action upon the subject by which it had been abstracted, the eye grew more sensible, and I was aware of another large black eye which was fixed upon mine from the bed of brown leaves before me. I could distinguish no form, no colour distinct from them: in fact, the leaves seemed to look at me. I approached nearer and nearer, but could discover nothing but the large, round, dark eye fixed intently upon mine. I was at a loss what to think: if the eye closed, I felt that there would be nothing left to prove that what I then saw was one of the clearest and most intelligent eyes I had ever beheld, when suddenly the little, round, light-brown head of a young Woodcock peeped out from what now became visible as the back of its mother, whose eye it was which had caused me so much astonishment. The little head disappeared again, and immediately afterwards the diminutive bird came out from the feathers of the old one's breast, bearing half its shell upon its back, and uttering that plaintive cry for which language has no sign. I retreated softly to my stone, but trod upon a long dead branch which lay concealed under the moss, and the extremity stirring the leaves and dry

sticks near the Woodcock; she rose, and trailing her wings along the ground, pattered round the stump of the birches, but stopped as she heard the wail of the little bird, which was running about like a tiny ball of brown chenille. In the nest there were two more eggs unhatched, but out of one I saw a little sharp bill and half of another small head peeping through the shell, and to relieve the anxiety of the *madre*, therefore, I immediately turned from her retreat, and dived down the terrace into the wood. Near the place where I found her there was a soft green 'stripe,' such as Woodcocks love. I had no doubt the family would be there next day; and as I passed near I turned aside to see what they were doing. Upon a dry bank, half-way down the brae, I almost stumbled over a bird which rose at my feet; and as it darted through the trees I saw that it had something in its claws, and at the same time I heard the plaintive cry of the little Woodcocks just under my feet. I looked down; there were two: and I thought a hawk had carried off the third, and perhaps killed the mother. I saw the bird light, as hawks very often do, especially in a close wood, when they have just caught their prey, and are impatient to satisfy their appetite. I sprang down the bank, determined, if I could not save the little victim, to spoil the hawk's breakfast. I flushed the bird so suddenly, that, after a low flight of only a few yards, it dropped what it was carrying, and instantly lighted not half-a-dozen paces distant. I ran to pick up the mangled prey, when to my surprise I found a vigorous little Woodcock running about as nimble and active as its *madre* could wish. I looked for the hawk, but in his stead saw the old Woodcock, in great consternation, trailing her wings as if wounded, and busy to attract my notice. As soon as I followed, she led me away, hirpling and halting like an 'old wife,' taking little flights, which became longer as she drew me farther; till at last, thinking she had sufficiently succeeded, she took a turn down the brae, rose over the trees, and wheeling back dropped on the spot where she had left her charge. I gave her a little time to find him, which was not difficult, as he continued to call her as loud as his tiny bill could pipe. In a few moments I ran forward, and she rose with him *in her feet*, her long legs dangling and swinging with her little burden like a parachute. She lighted at no great distance, and as I again came upon her she got up, but in her hurry dropped the young bird. I instantly stopped, for she came to the ground almost at the same time with the little one, and she ran back and sat upon him, and rose again with him *in her claws*. I left her to pursue her flight in peace, and went on to my pass; but I have no doubt she went back for the other two, for, several times afterwards, I saw them all together in the soft green 'glac.'"

This very circumstantial account from so good an observer leaves no room for doubt in the mind of the reader, but an

independent observation by another equally good naturalist may be quoted for the purpose of showing that the young are carried in another and a different manner to that already described, and that they are thus transported, not only to escape their enemies, but for the purpose of obtaining food, which, in their unfledged state, they would be unable to procure at any distance from the nest. Charles St. John, in his 'Natural History and Sport in Moray' (p. 210), says:—

"I have again seen the old Woodcocks carrying their young down to the soft, marshy places to feed. Unfitted as their feet appear to be for grasping anything, the old birds must have no slight labour in carrying their whole family (generally consisting of four) every evening to the marshes, and back again in the morning. They always return before sunrise. Occasionally I have come upon a brood of young Woodcocks in a dark, quiet, swampy part of the woods, near which they have probably been bred. In a case of the kind we may suppose that the old birds are saved the trouble of conveying their young to a distant feeding-place; but as the young birds are frequently hatched in long heather in dry situations, and far from any marshes, they would inevitably perish in the nest were they not daily carried backwards and forwards by their parents. The quantity of worms required to sustain one of these birds would astonish those town-bred naturalists who gravely assert that the Woodcock 'lives on suction.'

* * * * As soon as the young are hatched, the old birds are obliged to carry them to the feeding-ground, which is often at some distance. The young, though able to run immediately, are tender helpless little things, and could by no means scramble through the tangled heather and herbage which often surround their nest, perhaps for many hundred yards. It long puzzled me how this portage was effected. That the old birds carried their young I had long since ascertained, having often seen them in the months of April and May in the act of doing so, as they flew towards nightfall from the woods down to the swamps in the low grounds. From close observation, however, I found out that the old Woodcock carries her young, even when larger than a Snipe, *not in her claws*, which seem quite incapable of holding up any weight, but *by clasping the little bird tightly between her thighs, and so holding it tight towards her own body*. In the summer and spring evenings the Woodcocks may be seen so employed passing to and fro, and uttering a gentle cry, on their way from the woods to the marshes. They not only carry their young to feed, but also, if the brood is suddenly come upon in the daytime, the old bird lifts up one of her young, flies off with it fifty or sixty yards, drops it quietly, and flies silently on. The little bird immediately runs a few yards, and then squats flat on the ground amongst the dead leaves, or whatever the ground is covered with. The

parent soon returns to the rest of her brood, and if the danger still threatens her, she lifts up and carries away another young bird in the same manner. I saw this take place on the 18th May; the young were then larger than, or fully as large as, a Snipe."

Here it will be observed that the narrator doubts the feasibility of any other mode of transport than that which he himself witnessed.

Thompson, in his 'Natural History of Ireland' (Birds, vol. ii. p. 253), refers to a keeper who believed that he had seen the old hen carrying off her young when suddenly disturbed. Under the impression of his having been deceived in the matter, he several times followed hens apparently thus burthened to where they alighted, and saw them run off without any young bird being there. It is, he says, the body behind the wings, the tail, legs, and feathers of the belly, that she droops down in a peculiar manner, that gives the appearance of a young bird being clutched up. He was several times quite near to birds presenting the appearance here described.

St. John's account of the mode of transport, however, has been confirmed by other observers. A correspondent writing from Rostrevor, Co. Down, in August, 1871, says:—"On the 2nd of this month I started a brace of Woodcocks close to me. One of them had a young one *pressed between its breast and feet*; it lighted on the ground again after rising, apparently to get a better grasp of its young one, and then flew off with it. They were near the edge of a wood in the afternoon and during sunshine." Another correspondent, writing from Rohallion, Birnam, says:—"This spring (1871) I have been witness repeatedly to the ability of the Woodcock to carry its young, and fly off with them, *pressed to its body by its legs*. This was in May and June."

Another method of transport is that referred to by Mr. W. Colquhoun (Dumbartonshire), who says:—"I have seen a Woodcock carry its young, but it was *by pressing it between its legs*."

Again, Mr. A. Hamond, jun., of Westacre, informed Mr. Stevenson that when in company with a friend and a gamekeeper, at Shielda, near Dingwall, in Ross-shire, he saw a Woodcock in the act of carrying a young one *in its claws* for some distance.

The old bird then returned and clucked about like a hen to draw the rest of the brood to her. His friend had observed the same proceeding on several occasions.*

Thus it is placed beyond doubt that the Woodcock is able to transport its young, in various positions, from place to place, not only when flying from its enemies, but also when going out to feed and returning.

This curious habit is not confined to the European Woodcock, but, according to Audubon and others, has been observed also in the American species. More recently, too, it has been witnessed in England in the case of the Common Snipe. A well-known sportsman who has adopted the pseudonym of "Idstone," writing in 'The Field' of 30th May, 1874, says that on the 22nd of the same month, when crossing a marsh on his way to a trout stream, a Snipe rose almost at his feet, "and there was attached to it, mostly on its left or near side, a young Snipe, which it carried, or which clung to it, for about twenty-five yards." He could distinctly see the markings on the young one, and is therefore positive that he was not mistaken. The locality was close to Laurence's Mill, Morden, Dorsetshire. In the same number of 'The Field,' Mr. John Titterton, of Ely, Cambridgeshire, states that a similar thing was observed near Ely, also in May of the same year.

These observations confirm our impression that, while the old birds are able to carry their young in two or three different positions, that which has been so skilfully depicted by Mr. Wolf, in the accompanying plate, is probably the one most commonly employed.

* 'The Birds of Norfolk,' vol. ii. pp. 292, 293.

MR. E. R. ALSTON ON THE BRITISH MARTENS.

[At the last scientific meeting of the Zoological Society a paper was read by Mr. Alston "On the Specific Identity of the British Martens." The subject being one which has especial interest for naturalists in this country, it is believed that the publication of Mr. Alston's remarks in this journal will be appreciated by many who would not otherwise have an opportunity of perusing them. We need hardly say that should any of our correspondents be in a position to examine specimens of British-killed Martens, whether recent or otherwise, by the light of Mr. Alston's observations, we shall be glad to receive their criticisms.—ED.]

"Two European species of Martens," says Mr. Alston, "have been generally recognised by naturalists since the days of Albertus Magnus and Agricola, although some writers, including Linnæus himself, regarded them as identical. It is only of late years, however, that their specific distinctness has been finally proved; and, before considering the question of the identity of the British Martens, it will be well to point out the true synonymy and diagnostic characters of the species in question, concerning which some confusion still appears to exist.

Several systematic writers, especially in Germany and America, have assigned the Linnean title *Mustela* to the Martens, instead of to the more truly typical Weasels, on the ground that this had been done by Cuvier. But the names *Putorius* and *Mustela* were only employed by the great French zoologist to mark *sous-genres*, and were not used binomially to indicate distinct genera.* The first definite separation was made three years later by Nilsson, who gave the generic title of *Martes* to the present group;† and thus both priority and propriety sanction the restriction of the name *Mustela* to the true Weasels and Ermines. There has also been some difference of opinion as to the specific name which should properly be given to the *Mustela martes* of Linnæus. Many writers have employed *abietum*, apparently on the ground that it was used as a varietal name by Linnæus himself. This, however, is not the case: the varieties *abietum* and *fagorum* were

* 'Règne Animal' (1re éd. 1817), i. pp. 147, 199.

† 'Skand. Fauna' (1st ed. 1820), i. p. 41. The genus *Martes* has been quoted by Lilljeborg and some others as instituted by "G. Cuvier, 1797;" this error appears to have originated in a misunderstanding of the French plural *Martes* in the 'Tableau Élémentaire.'

not accepted by him; he merely says that such a distinction was recognised by the peasants.* Moreover, if *abietum* be used, the universally known name of *foina* for the allied species would have to be withdrawn in favour of *fagorum*. The earliest equivalent to *Mustela martes* appears undoubtedly to be Nilsson's *Martes sylvatica*; and the synonymy of the two species should therefore stand thus:—

I. MARTES SYLVATICA (The Pine Marten).

- Mustela martes*, Linnæus, Syst. Nat. (12th ed.), i. p. 67 (1766).
Martes sylvatica, Nilsson, Faun. Skand. (1st ed.), i. p. 41 (1820).
 „ *vulgaris*, Griffith, Cuvier's An. Kingd., v. p. 123 (1827).
 „ *abietum*, Fleming, Brit. Animals, p. 14, ex Ray (1828).
 „ *sylvestris*, Nilsson, Faun. Skand. (2d ed.), i. p. 171, ex Gesner (1827).

II. MARTES FOINA (The Beech Marten).

- Mustela foina*, Erxleben, Syst. Reg. An., p. 458 (1777).†
Martes foina, Nilsson, Faun. Skand. (1st ed.), i. p. 38 (1820).
 „ *fagorum*, Fleming, Brit. Animals, p. 14, ex Ray (1828).

The cranial and dental characters by which *Martes sylvatica* and *M. foina* may be recognised were first pointed out by Dr. R. Hensel in 1853,‡ further elaborated by Blasius in 1857,§ and recently revised by Dr. Elliott Coues in comparison with their American congeners.||

“At various times,” adds Mr. Alston, “I have carefully compared the descriptions of these writers with a great number of skulls; and although many of the distinctions which they have pointed out are merely comparative, and though some of them prove to be inconstant when a large series of specimens are examined, yet I have never found the slightest difficulty in

* “Varietas duplex rusticis: *Fagorum* gutture albo; *Abietum* gutture flavo.” Syst. Nat. (12th ed.), i. p. 67.

† Dr. Elliott Coues, in his ‘Fur-bearing Animals’ (p. 77), gives *M. foina* as instituted by “White, Phil. Trans. lxiv. 1774, 196,” having seemingly been misled by some reference to Gilbert White’s celebrated Monograph of the House Martin, *Hirundo urbica*!

‡ ‘Arch. f. Naturg.,’ xix. 17—22, pl. ii.

§ ‘Säugeth, Deutschl.,’ pp. 211—219.

|| ‘Fur-bearing Animals,’ pp. 74—80, pls. iii., iv.

separating the species by the following external and internal characters:—

Martes sylvatica.—Outer fur rich dark brown, under fur reddish grey, with clear reddish yellow tips; breast-spot usually yellow, varying from bright orange to pale cream-colour or yellowish white. Breadth of the skull across the zygomatic arches rather more than half the length; the arches highest posteriorly, whence they slope rather suddenly downwards and forwards. Sides of muzzle nearly parallel; anterior opening of nares oval; postorbital process about equidistant between the frontal constriction and the anterior root of the zygoma. Palate comparatively narrow, with a distinct azygos process on its posterior margin. Upper premolars placed regularly in the line of the series; the fourth as long as the upper molar is broad, its inner cusp large and placed nearly at right angles to the axis of the tooth. Upper molar broader than long, its flattened inner portion considerably longer and larger than the outer part; in the latter the external tubercle fills the space between the anterior and posterior tubercles, *so that the external outline of the tooth is simply convex, not emarginated*.* First lower molar with a slightly developed inner tubercle at the base of the main cusp.

Martes foina.—Outer fur dull greyish brown, under fur greyish white; breast-spot smaller than in *M. sylvatica*, pure white. Breadth of the skull across the zygomatic arches much more than half the length; the arches regularly curved, broadest and highest near their middle. Sides of muzzle slightly converging; anterior opening of nares broader than in *M. sylvatica*, heart-shaped; postorbital process nearer to the frontal constriction than to the anterior root of the zygoma. Palate comparatively broad, truncated posteriorly. Upper premolars crowded, and often placed diagonally, their anterior extremities being directed inwards; the fourth considerably longer than the upper molar is broad; its inner cusp smaller, and placed more diagonally than in *M. sylvatica*. Upper molar subquadrate, its flattened inner portion hardly longer or larger than the outer part, in which the external and anterior tubercles are placed close together, *the external outline of the tooth being distinctly emarginated* between them and the*

* We have italicised Mr. Alston's words here, in order to indicate a character upon which especial reliance is placed. In the 'Proceedings of the Zoological Society,' from which we quote, the skulls of both species are figured.—ED.

posterior tubercle. First lower molar with a well-developed inner tubercle at the base of the main cusp.

As Blasius has remarked, the differences of proportion are less conspicuous when a skull of an aged example of *M. foina* is compared with that of a young *M. sylvatica* than when individuals of the same age are contrasted; nevertheless they are always present to an appreciable degree. In his figures Blasius has represented a further distinction, in the form of the transverse ridges of the soft palate; but I have not had an opportunity of testing the constancy of this feature; nor have I sufficient materials for any original observations on the distinctive marks of the American and Siberian Martens, as to which I can only refer the reader to the descriptions of Drs. Couest† and Midden-dorff.‡ On the whole, it may be said that the most striking and trustworthy of the characters enumerated above are, *externally*, the colour of the under fur, and, *internally*, the comparative breadth of the skull and the shape of the upper molar.§

Having thus cleared the ground as to the synonymy and distinguishing marks of the two European Martens, we come to the question *whether both of them inhabit our own islands.* Every work hitherto published on the British fauna has either stated or assumed that both forms are natives; and almost every one has represented the white-breasted *Martes foina* (the Common Marten of the Continent) as being also the prevailing species in Britain. Several, however, of our best zoologists have expressed grave doubts as to the specific distinction of the two forms, or have even denied that they could be separated as constant varieties. This will be evident from a glance at the pages of the principal writers on the subject.

Passing over the older writers, who merely copied the accounts of Gesner and Aldrovandus, we may come at once to Pennant, who describes *Mustela foina* as 'The Martin,' distinguishing 'The Yellow-breasted Martin' as a distinct species, of which he says

* 'Fur-bearing Animals,' pp. 59–96, pls. ii., iv.

† 'Reise in Sibir.,' ii. Th. ii. pp. 68, 69, pl. ii. figs. 1–6.

‡ It should be observed that Dr. Severtzoff has stated that our European Martens are "not fully differentiated" in Eastern Turkestan, and has described some skins which he saw there as a new species, *Mustela intermedia* (Turkestanskije Jevotnie, p. 80; Ann. and Mag. Nat. Hist., 4th ser. xviii. p. 46); but as he obtained no skulls, much weight cannot be laid on his observations.

that it 'is found in *Great Britain*; but is much less common in *England* than the former; it is sometimes taken in the counties of *Merioneth* and *Caernarvon*, where it is distinguished from the other kind by the name of *bela goed*, or Wood Martin, it being supposed entirely to inhabit the woods, the *bela graig* to dwell only among the rocks. Though this is so rare in these parts, yet in *Scotland* it is the only kind; where it inhabits the fir forests, building its nest at the top of the trees.*

Pennant was followed by subsequent writers without much additional information being supplied. Thus Bingley states that the 'Common Martin' is 'not very uncommon in many of the southern parts of Great Britain and Ireland;' while 'Pine Martins are sometimes, though rarely, observed in the wooded and thinly inhabited districts of Wales and Scotland, and two or three of the northern counties of England.†

Fleming gives the habitat of *Martes jagorum* as 'In woods and rocks in the south of Scotland and England;' that of *M. abietum*, 'in the wooded districts of Wales and Scotland;' but adds that 'the characters of these two species are ill-defined.‡

The Rev. L. Jenyns, in his excellent 'Manual,' considered that *Mustela foina* was 'more generally diffused' than *M. martes*, which, he says, 'inhabits the fir-woods of Scotland: occurs also sparingly in the West of England.§

Edward T. Bennett, then Secretary of the Zoological Society, discussed the question of the distinctness of the Beech and Pine Martens in 1835, evidently inclining to the belief that they were specifically identical, and referring two British specimens then in the Society's Museum to the former and two others to the latter race.|| What was the ultimate fate of these examples I know not; but it is to be remarked that no exact localities are mentioned, and that the supposed 'Beech Martens' had 'dirty-white breasts:' not improbably they were faded specimens.

Two years later appeared the first edition of Mr. Bell's standard work, in which he gave separate figures and descriptions of the two Martens, but 'with the precaution of a protest against being

* 'British Zoology' (1768), i. p. 81.

† 'Mem. Brit. Quad.' (1809), pp. 164, 169.

‡ 'Hist. Brit. Anim.' (1828), pp. 14, 15.

§ 'Man. Brit. Vert. An.' (1835), p. 11.

|| 'Gard. and Menag. of the Zool. Soc.' (1835), i. pp. 227—240.

considered as decidedly supporting the opinion that they are essentially different.' No new information was here given as to the supposed distribution of the animals in this country.* In Scotland, however, the elder Macgillivray had better opportunities for observation, and a comparison of specimens convinced him of 'the indivisibility of the species.' Young specimens, he says, have yellow throats, and are the Pine Martens of authors; while 'in old individuals the whole fore-neck and part of the breast are white, or greyish white, or pale grey mottled with brownish. The yellow colour on the throat fades in specimens kept in Museums, so as at length to be scarcely perceptible.'† In Ireland, W. Thompson came to similar conclusions, observing that 'all the native specimens which have come under my own notice were yellow-breasted (*Martes abietum*), with the exception of one, which had the breast white (*M. foina*), and was killed in the county of Antrim.' He adds that he had long since remarked that the yellow colour gave place to white with advancing age, and explained the greater number of yellow-breasted specimens obtained by their comparative immaturity.‡

The author who has most recently treated of the question is Mr. Bell. In his revised second edition of the 'Quadrupeds' he fully accepts the specific distinction of the two forms, regarding which he was formerly so doubtful, and quotes a letter from Mr. R. T. Vyner, who 'concludes that the Beech Marten is at present much less common than the Pine, and is, indeed, very nearly extinct in England, which is accounted for by its habit of leaving its summer haunts of woods and rocky places, to inhabit, in the winter, farm buildings, faggot-stacks, and other similar localities, and thus becoming exposed to various means of destruction. The Pine Marten, on the contrary, continues to inhabit, at all seasons of the year, its accustomed retired haunts, rarely, if ever, intruding into the immediate purlieus of human habitations.'§

It will thus be seen that the later and better-informed English faunists gradually approached agreement as to the existence of

* 'British Quadrupeds,' 1st ed (1837), pp. 167—176. [Reference might also be made here to a paper by Mr. Eyton, 'Ann. Nat. Hist.' 1840, p. 290.—Ed.]

† 'Brit. Quadr.' (Nat. Libr. xx. 1838), pp. 166—173.

‡ 'Nat. Hist. Ireland' (1856), iv. p. 9.

§ 'British Quadrupeds,' 2nd ed. (1874), p. 212.

only one species of Marten in Britain, and that some of them drew the natural though erroneous deduction that *Martes sylvatica* and *M. foina* were specifically identical. The fact is, as I believe, that *M. foina* is not, and never was, a member of the British fauna. During the last ten years I have missed no opportunity of examining native Martens, and have endeavoured to trace out every supposed 'Beech Marten' that I could hear of. I have thus seen a very large number of specimens from various parts of England, Wales, Scotland, and Ireland; and *every one* has proved to be the Pine Marten. The late Mr. Blyth, who paid some attention to this question, assured me, shortly before his death, that his investigations had led him to the same result; and I have been unable to find any competent observer acquainted with the true characters of the species, who has ever seen an authentic British-killed specimen of *M. foina*. Macgillivray and Thompson were certainly correct in saying that the pale-chested individuals which have usually received that name in this country are merely aged examples of the Pine Marten, or specimens which have faded in museums. Nor does there appear to be the slightest evidence in favour of Mr. Vyner's suggestion that *M. foina* has been recently exterminated in this country. Such a fate has not overtaken the species on the Continent, where it holds its own fully as well as its ally; and a subfossil skull found in Burwell Fen, Cambridgeshire, and exhibited to the Zoological Society in 1873, by Mr. J. W. Clark,* is certainly referable to *M. sylvatica*. The true Beech Marten is undoubtedly a more southern species than its congener, finding its northern limits in Denmark and the Baltic Provinces; for Professor Lilljeborg has proved that it is not, as had been stated, a native of Sweden.† Until an authentic British specimen has been produced, it must also, I think, be struck out of the lists of the British fauna.

I will conclude with a few remarks on the present distribution of the Pine Marten in Britain, much of the information being gleaned from the pages of 'The Zoologist.' Although greatly reduced in numbers by persecution, it still maintains its ground in the wilder districts of Scotland, the North of England, Wales, and Ireland, and occasionally specimens are killed in counties where the species was thought to have been long extinct. In

* 'Proceedings Zool. Soc.,' 1873, p. 790.

† 'Sverg. og. Norg. Rygggradsdjur,' p. 535.

Scotland it is still found, though comparatively rarely, in the Lews and in most of the Highland mainland counties, being perhaps most abundant in Sutherland and Ross-shire, especially in the deer-forests. In the Lowlands a Marten is now a very great rarity; but a fine example was killed in Ayrshire in the winter of 1875-76. In the North of England, Mr. W. A. Durnford says, the species is 'still plentiful' in the wilder parts of Cumberland, Westmoreland, and Lancashire;* and in Lincolnshire several have been recorded, the latest, killed in 1865, by Mr. Cordeaux.† In Norfolk one was shot last year;‡ and I have myself examined a fine example, which was shot in Hertfordshire, within twenty miles of London, in December, 1872. In Dorsetshire the last is said to have been killed in 1804;§ but a specimen occurred in Hampshire about forty years ago;|| and another in Surrey in 1847. A Marten is said, by the Rev. C. A. Bury, to have been 'seen' in the Isle of Wight;¶ and one was recorded from Cornwall, by Mr. E. Hearle Rodd;** but this proves on investigation to be an error, the specimen having been brought from North Wales, where Martens appear to be still not very rare. In Ireland the following counties were enumerated by Thompson as habitats of this species:—Donegal, Londonderry, Antrim, Down, Armagh, Fermanagh, Longford, Galway, Tipperary, Cork, and Kerry.†† The *Cat-crann* is probably now a rarer animal in Ireland than it was when Thompson wrote; but it still exists in various districts, especially in the County Kerry, whence the Society has received several living examples; and Professor A. Leith Adams states that it has been seen of late years even in the County Dublin." ‡‡

* 'Zoologist,' 1877, pp. 291. [See also Parker, Zool. 1879, p. 171.]

† 'Zoologist,' 1866, p. 242. [Not quite the latest; others have since been recorded; Zool. 1877, p. 251, and 1879, p. 420.—ED.]

‡ F. Norgate, 'Zoologist,' 1879, p. 172; J. H. Gurney, *tom. cit.* p. 210.

§ J. C. Mansel-Pleydell, *tom. cit.*, p. 171.

|| P. L. Sclater, 'Zoologist,' 1845, p. 1018.

¶ 'Zoologist,' 1844, p. 783.

** Id., 1878, p. 127.

†† 'Natural History of Ireland,' iv. p. 9.

‡‡ 'Proceedings of the Royal Society of Dublin,' 1878.

THE BIRDS OF DUBLIN AND WICKLOW.

By H. L. Cox, M.B.

IN the following notes I do not propose to give a full list of all the birds that have been met with in the counties of Dublin and Wicklow; but merely to collect, in a readable form, a few rough notes relating to those which I have observed myself during the last seven or eight years. These I hope may prove of use and interest to other ornithologists.*

PEREGRINE FALCON.—I once saw one on the east side of Ireland's Eye. It allowed me to get within seventy yards before it flew! This was in September, 1877.

MERLIN.—Seen two or three times at Lough Dan, at Howth, and on the Sugar-loaf. I have never found it breeding, though I saw it at Lough Dan in April and May, 1875.

KESTREL.—Numerous in both counties in suitable localities. A pair breed at Lough Dan almost every year. They used to nest on Bray Head; but I think they have been frightened away. They may be seen about Howth and Ireland's Eye during the spring.

SPARROWHAWK.—By far the commonest hawk in Dublin and Wicklow. I have often seen it in the streets of Dublin during the winter.

COMMON BUZZARD.—I saw one in April, 1875, between Annamoe and Lara; it was hovering about a bare piece of mountain, about a mile up the river from the latter village.

BARN OWL.—Generally distributed.

LONG-EARED OWL.—Found in all suitable localities. I have seen it near Blanchestown, and shot one on the canal between that place and Dublin, at No. 8 Lock. I have also met with it in Wicklow, near Roundwood and at Enniskerry.

SHORT-EARED OWL.—Occurs chiefly in autumn and the early part of winter. I have seen three, at different times, on the sand-hills at the North Bull. I shot one there on December 6th, 1872. I met with another on the South Bull in November, 1877, during a stiff breeze.

* In 'The Zoologist' for 1866 (pp. 93, 295, 479) will be found some "Ornithological Notes from the County Dublin," by Mr. Blake-Knox; and at pp. 220, 300, of the same volume, an account of "The Migratory and Wandering Birds of the County Dublin," by the same pen.—ED.

WATER OUZEL.—Observed on almost every stream south of Dublin, but not on any of those on the north side. I have seen it also on every stream that I have fished or walked along in Wicklow. Although it may not be met with on the Dodder close to Dublin, yet on its tributaries, at Rathfarnham, several may be seen any day. I have taken the eggs in Wicklow.

MISSSEL THRUSH.—Common, and breeds abundantly. A pair generally brings out a brood in the Park, Trinity College. During the past winter its numbers were greatly reduced by the severe weather; scarcely one is now to be seen.

REDWING.—Common during the winter. I obtained one as late as May 1st, out of a flock near Dunsink. These were the first birds that suffered during the hard weather; five days after its commencement they could be caught with a cap.

FIELDFARE.—A regular winter visitor. These birds on the seventh or eighth day of the hard weather (1878-79) had been so much weakened by the snow and frost that I caught two of them. Three or four days later I found dead ones.

SONG THRUSH.—Common everywhere, and increases during the autumn; these remain all winter, unless it is very severe. I am afraid this bird is also nearly extinct after last winter.

BLACKBIRD.—Common everywhere, particularly on the north side of Dublin. They come into the town in hard weather in considerable numbers. I have snared four or five in a yard in Eccles Street during snow or frost, and often a couple in open weather. Like Thrushes, they increase in numbers during the winter.

RING OUZEL.—On May 5th, 1875, when fishing in the River Annamoe, about a mile above Lara, one flew down the side of the hill and settled on the root of a dead tree within fifteen yards of me. I had a walking-stick gun with me, but by the time I took it off my basket and had it almost loaded the bird flew off.

ROBIN.—Common. I once saw a variety with white wings.

WHEATEAR.—Numerous in certain places. On its first arrival numbers may be seen near the Pigeon House Fort, and also on the shore from Dollymount to Dublin. Late in the season, before leaving us, they congregate on the North Bull.

WHINCHAT.—I shot one of these birds on May 9th, 1875, on the side of the road from Roundwood to Annamoe, about half a mile from the latter place; but it was so mangled that it was not worth preserving.

STONECHAT.—Numerous, and breeds in suitable localities. I have taken the nests near Roundwood and at Howth.

WHITETHROAT.—Somewhat local. When walking up the canal towards Blanchestown, or in the neighbourhood of the Tolka, it may often be seen and heard. There many other spots, too, where it may be found.

WILLOW WREN.—Abundant in both counties, and may be heard from the first week in April for six or seven weeks. The Wood Wren has occurred at Glen Druid, Co. Dublin, but I have not met with it myself.

CHIFFCHAFF.—Not so numerous as the Willow Wren, but still a common bird.

SEDGE WARBLER.—Occurs along every stream, canal, and river, where there are reeds or willows, and cover of this description.

GOLDEN-CRESTED WREN.—Numerous, but seems more abundant in early spring than at any other time.

GREAT TIT.—I have met with this bird in almost every part of the two counties; but it is nowhere very numerous. I have seen it at times in the squares and gardens in Dublin.

BLUE TIT.—Common everywhere, even in Dublin. Those seen in town are generally very shabby, being covered with soot.

COLE TIT.—Nearly as common as the Blue Tit; in some places more numerous.

PIED WAGTAIL.—Frequent, though less numerous than in the North of Ireland, preferring the neighbourhood of the sea.

GREY WAGTAIL, *Motacilla sulphurea*, Bechst.—Common. I have found a pair every few hundred yards, in the spring, along the streams in both counties. It is particularly numerous on the Tolka, the Dodder, and the stream that runs through Bray. It is more generally distributed, and in the spring much more numerous, than the Pied Wagtail.

SPOTTED FLYCATCHER.—A scarce bird, but every year certain places are frequented by a pair—possibly the same pair, as they seem to use the same twig to sit on and watch for their prey.

RAVEN.—On several days during the month of April, 1874, I saw a Raven wheeling about above the mountains on the shores of Lough Dan.

CARRION CROW.—I saw a pair of birds on the evening of the 24th May, 1878, which I suspect were Crows. They were in an

old elm tree at the corner, opposite a grave-yard, beside one of Mr. Ion Trant Hamilton's gates. When I first saw them they were moving about near the top. They flew out several times, and when on the wing uttered a hoarse croak, deeper almost than that of a Raven; then, sailing round, alighted again and again. At last they took fright and flew off, and although I often visited the spot afterwards I never saw them again. These are the only birds I have met with that could be Carrion Crows.

HOODED CROW.—This bird I have seen once or twice on the Wicklow Mountains in the spring, but oftener on the sea-shore in winter, though seldom more than two or three at once.

ROOK.—Met with everywhere, even in Grafton Street, if one is up early enough to see it. They destroyed an immense number of small birds during the hard weather last winter, and in this way they fared well, chiefly at the expense of Thrushes and Redwings.

JACKDAW.—Common. In the spring they come into Dublin, and make use of any blind chimneys they can find to build in.

MAGPIE.—I have observed this bird in both counties, but nowhere abundant when compared with some parts of Ireland.

STARLING.—Common, and increasing annually. This increase is most remarkable in the winter flocks.

GREENFINCH.—Numerous and generally distributed.

LINNET.—Pretty common in suitable localities. During winter large numbers may be found all along the coast.

LESSER REDPOLL.—This bird is far less common here than in the North of Ireland. A few pairs breed every year near Dunsink. I have also found the nest in different parts of Wicklow, and in the County Dublin, but nowhere abundant.

TWITE.—I have often shot this bird on the North Bull during the winter, amongst flocks of other small birds, and also near the Pigeon-House Fort. It breeds near the foot of the Dublin Mountains, though I have never visited its breeding haunt. In December, 1878, it was numerous all along the coast.

GOLDFINCH.—Seldom seen in either county. In the neighbourhood of Rush and Lusk I have observed one or two during the winter, and have occasionally heard one in other parts of the county. I met with them near Finglass once or twice, and once saw a pair near Enniskerry, always in the autumn or winter.

SISKIN.—Observed every winter, but I have never come across a flock of more than five or six. They may be heard almost any day in winter along the valley of the Tolka, though not always seen, as they are generally on the other side of the river. I shot a hen bird on March 15th, 1878, in this neighbourhood. Near Donnybrook Chapel I have seen them during winter; and near Bray, and in other places, I have occasionally seen a solitary one. I fancy that some of them breed in Powerscourt, as I have heard one or two there on June 23rd and also on July 1st, 1878, when I happened to be there.

CHAFFINCH.—Our commonest bird. It is met with everywhere, and in some places in large numbers.

SPARROW.—Common. There is a periodical migration of these birds from and to the city of Dublin. They disappear soon after the young birds are full grown, and do not return until about the end of October or beginning of November, when nice clean, fresh-looking Sparrows are to be seen for a short time; but they soon lose their clean appearance, and become regular town birds again. I have several times seen pied varieties in the streets.

COMMON BUNTING.—Found in suitable localities, and numerous near the sea-coast from Dollymount to Malahide. In the winter, usually, a few may be seen near the Pigeon-House Fort and North Bull.

YELLOWHAMMER.—Common in suitable localities in both counties. It seems to have withstood the late severe winter almost better than any other bird.

BLACK-HEADED BUNTING.—Local. I have seen it near Baldoyle, Malahide, and also in Wicklow.

SNOW BUNTING.—Hitherto I have considered this bird a regular winter visitor; but last winter I did not come across a single specimen. In 1872 there were some hundreds in a flock on the North Bull, where there were always a few to be seen until the winter of 1877-78. I have twice seen them as late as the first week in May. In 1876 and 1877 these birds were frequently to be seen between the Coastguard Station and the Pigeon-House Fort; there were five the first year and two the second. They were very tame, allowing approach within five or six feet of them.

BULLFINCH.—This bird is getting scarce, particularly on the north side of Dublin. In 1871 and 1872 I used to see a good many, but since then they have either been destroyed or have

left, being hardly ever seen except on the south side of the city towards the mountains.

SKY LARK.—Common, increasing considerably in numbers in winter.

MEADOW PIPIT.—Common everywhere.

ROCK PIPIT, *Anthus obscurus*, Lath.—This is a scarce bird, even in suitable localities. I have seen it all along the coast of both counties, but nowhere numerous. The Meadow Pipit outnumbers it, even on Ireland's Eye, where one would imagine it would be in a majority.

TREE CREEPER.—I have met with this bird in every wooded district. It is easier found in spring, being then more vociferous.

WREN.—Numerous everywhere.

CUCKOO.—In variable numbers every spring.

KINGFISHER.—I have seen this bird on the Liffey and almost every stream north of it. It is found, as a rule, on the same rivers as the Dipper, preferring the more sluggish streams. During the autumn I have often observed them along the sea. On the Clontarf shore, in October and November, they are not rare; nor at Malahide and other places. The numbers seem to have been much thinned during the past winter.

GOATSUCKER.—This I believe to be a very scarce bird. In May, 1875, I heard one near Lara almost every night for about three weeks, but could never see it. I know that they also come regularly to Bray, but I never could see or hear them there.

SWALLOW.—A regular summer visitor.

SAND MARTIN.—Also a regular visitor, but in limited numbers.

HOUSE MARTIN.—More numerous than the Sand Martin, but only in suitable localities. Amongst other places, they breed along Howth and Bray Head.

SWIFT.—A regular summer visitor. Very common in Dublin, where it may be both seen and heard any day when breeding under the slates of a house, and may be heard crawling about and squealing almost all night long.

(To be continued.)

OCCASIONAL NOTES.

THE ZOOLOGICAL STATION AT NAPLES.—The Zoological Station at Naples has undertaken the publication of a new Zoological Record, in which equal attention will be paid to all departments of Zoology. A large staff of zoologists of various nationalities will act as recorders under the editorship of Prof. J. V. Carus, of Leipsig; and the first volume, dealing with the literature of the current year, will appear in 1880. All those engaged in zoological work on any group of the Animal Kingdom are invited to send a copy of their papers to Prof. J. V. Carus, Leipsig, Querstrasse 30, and to write on the address "for the *Jahresbericht*." Papers so sent will be distributed by Prof. Carus amongst the recorders, and, after being abstracted for the Record, will be deposited in the Library of the Zoological Station at Naples.—ANTON DOHRN (Naples).

AN ALBINO WEASEL.—On September 27th I was fortunate enough to obtain a pure white Weasel, full grown, a true albino, with pink eyes. It was killed by a dog in Soham Fen, Cambridgeshire, on the 17th of the month, and has been very well set up by Mr. John Baker, naturalist, of Cambridge. This variety is so rare in England that I think it worth recording. I have never seen a true albino Stoat. Were such a variety procurable I am convinced it would be entirely white to the tip of the tail.—FREDERICK BOND (Staines).

THE GREAT SKUA.—In May and June this year a friend and I were in the Shetland Islands, chiefly for the purpose of collecting eggs. We had the gratification of seeing the Great Skua in its haunts, and it is almost worth the journey to see this bird alone; especially interesting because so soon likely to become extinct as a breeding bird in Britain. Had Mr. Saxby been living, he would not have thought the light-house men most to be feared for its extinction; the circumstance I refer to was not in existence in his time. As is well known to naturalists, there are only two places in Britain where it now breeds, Unst and Foula. In one place I do not think we saw more than five or six birds, though the shepherd, who is daily on the hills, thinks there may be five or six pairs. From circumstances which came to my knowledge, but to which I cannot give full publicity, one of these is likely to know the birds no more in a very short time. You will appreciate the danger when you understand that, previous to this year,

nobody in the locality I am speaking of knew how to drill and blow the eggs; but now a person well able to get the eggs is going to do so, and will blow them and keep them by him to sell to visitors who may come at any time of the year. There are but few visitors in the early part of the year, May and June, when the birds are breeding, so they have not been much molested by strangers. Money is scarce with the poor people up there; so that, now they know how to keep the eggs until visitors come, you may guess what chance the few remaining birds will have of hatching. I need not describe the beauty of the bird, nor its flight, nor its boldness in defending its nest from intruders. Its courage in swooping down at persons to within an inch of their heads must be the admiration of all naturalists, and is delightful to see, but this very boldness might easily lead to its destruction. On a late occasion some persons got permission to shoot a pair of Arctic Skuas, but the Arctic Skuas were not the only ones they took away with them, "because they came falling down somehow"! So I was informed. I think—as no doubt will everyone who has ever seen the bird—it would be a pity, a great loss indeed, should the birds become extinct from man's cupidity. One of the best ways to secure its preservation would probably be to increase the number of breeding places. I know of two suitable places, Hascosea and Noss; there may be another or two known to some of your readers. Lonely places they must be where the Arctic Skua breeds! The plan I would propose is to get twenty or thirty Great Skua's eggs, and cause them to be hatched by Arctic Skuas; then the young birds would return to breed in the same places, for it seems the Skuas are greatly attached to their breeding haunts, and will not forsake them nor leave them except they are fairly driven away or killed. Now if they could be established in three or four other good places, where perhaps some arrangements might be made for their protection (such as, I think, Mr. Micklejohn would make for Noss) the birds might become numerous again. It would probably take two months or more to get the eggs from Iceland,—to make arrangements and take care of the eggs whilst hatching,—and, as there would be considerable expense, I should be glad to help in the matter. It is hardly to be expected that anyone would undertake it unaided. From my own experience, however, in carrying out a similar plan with Owls, I am sure it might be managed by a suitable person, knowing what to do and how to do it, and having time at his disposal. If some enthusiastic naturalist would undertake to carry out the plan next year—some one you thought would succeed—perhaps you would receive the subscriptions of those who would like to contribute to the preservation of this bird from extinction in the British Isles. I think perhaps £20 would serve to get the eggs from Iceland and other extra expenses. I commend the matter to the consideration of all those who would like to preserve our rarer British birds.—W. PURNELL (Bell Street, Henley-on-Thames).

GREBES OCCURRING IN THE FÆROE ISLANDS.—In some notes on "The Birds of the Færoe Islands," published by me in 'The Zoologist,' 1872, page 3256, a mistake occurs in the scientific name of one of the Grebes recorded in that list. The Horned or Sclavonian Grebe, *P. cornutus* (Gmelin), is a tolerably common autumnal and winter visitor to the group. I have, or had, a specimen captured in October, 1871—the one referred to in my above-quoted notes—and another captured in March, 1873, near Thorshavn; Mr. Hargitt has two or three specimens in his collection, and Müller writes of it as being a common autumnal visitant to the Færoe Islands, though it does not breed there. No specimen of the Eared Grebe, *P. nigricollis*, as far as I am aware, has been obtained in Iceland or the Færoes. The trivial name given in my list (page 3256 of the volume for 1872), viz., "Sclavonian Grebe," is correct; but the scientific term, *P. nigricollis*, is incorrect, and should be *P. cornutus* (Gmelin).—H. W. FEILDEN.

MANX SHEARWATER IN OXFORDSHIRE AND NORTHAMPTONSHIRE.—In his note to 'The Zoologist' (p. 426) on the Manx Shearwater, Lord Lilford remarks, "The weather that can drive such a hardy sea-rover as a Shearwater some forty miles inland at this time of year is certainly very exceptional." It is, however, worthy of remark that this is not the first time that the Manx Shearwater has been obtained in our district in September. In 1839 Mr. Goatley, of Chipping Norton, records, at p. 2625 of 'The Zoologist,' that he captured one alive in September of that year. In 1878, at p. 135, of this periodical I noticed one in my possession caught, alive, at Chipping Norton in the winter of 1872-73. At p. 220 of the volume for the same year I recorded two instances—one at Framington, Oxfordshire, in September, 1877; the other at Chacombe, Northamptonshire, date of capture unknown. Another was shot at Wroxton, near Banbury—I am not sure at what season of the year, but I fancy in the winter. In Plot's 'Natural History of Oxfordshire' is the following note:—"The Cormorant has been observed to come hither about harvest time, whereof there was one killed from St. Mary's steeple (tired with a long flight), an. 1675, and another young one taken up in Arncot field, fallen down in the corn, and brought me to Oxford." Mr. J. H. Gurney, Jun., in a letter to me, of August 19th of this year, suggests that the young Cormorant which had fallen down in corn might have been a Manx Shearwater. If Mr. Gurney's supposition is correct, it will be noticed that from the mention of the corn we may conclude it also was obtained in August or September. Since writing the above, Lord Lilford has very kindly sent me an extract from his note-book concerning a second Manx Shearwater in Northamptonshire,—“Shearwater, caught feeding with chickens in Northampton, September, 1866,”—and adds, "This bears out your views of the prevalence of September occurrences of this species. I do not understand why Mr. Gurney should suppose that the

young Cormorant recorded in Plot's 'Natural History of Oxfordshire' as 'fallen down in the corn' should be a Shearwater." It is therefore to be remarked that out of six or seven Shearwaters captured in the two counties no less than four occurred in the month of September.—C. MATTHEW PRIOR (Bedford).

UNCOMMON BIRDS AT BARMOUTH.—On September 13th, whilst walking along the shore at Barmouth, Merionethshire, I observed six or seven birds sitting on the water a long distance from land, which, by the aid of a good pocket telescope, I discovered were Common Scoters. I was afterwards informed that there have been a good number of them about. A pair of Great Northern Divers were several times seen during the winter on the Barmouth Island, but—fortunately for them!—they were exceedingly difficult to get near. I picked up a Manx Shearwater in a dying state some distance from the town, at high-water mark, and was shown another which had been picked up dead almost in Barmouth itself.—J. BACKHOUSE, JUN. (West Bank, York).

GREEN-BACKED PORPHYRIO AT BARTON.—The Green-backed Porphyrio (*Porphyrio smaragdonotus*, Tem., *P. hyacinthinus*, Brehm, jun., nec Tem.) has occurred, for the third time in Norfolk, on August 23rd, on Barton Broad, the same locality which produced the last. The specimen is at present in the hands of Mr. T. E. Gunn, of St. Giles' Street, Norwich, who informs me that it was a female, with eggs about the size of hemp-seed, and weighed one pound seven ounces. It does not show the slightest traces of confinement, and I have little doubt it was a migrant hither. The species is found as near as the North of Egypt. When in that country, in 1875, I met with it a few miles from Cairo. It has been confounded with the Purple Waterhen of the South of Europe (*Porphyrio hyacinthinus*, Tem.), and in all probability some of the examples of the Purple Waterhen which have been recorded as occurring in England belonged to the more southern green-backed species. Four specimens have been obtained in Norfolk, but there is good reason for supposing that one of them—the example recorded at Hickling—was an escaped bird; the other three appear to have been all wild.—J. H. GURNEY, JUN. (Northrepps, Norwich).

SPOTTED CRAKE IN COUNTY DOWN.—I have just received (October 15) a fine specimen of the Spotted Crake, which was shot by Mr. Frank Thompson, at Baubridge, Co. Down. It is curious that the last recorded Irish specimen was killed by another pupil of mine, Mr. G. E. Armstrong, about two years since. This bird has only fallen under the notice of Mr. Williams, the naturalist here, three times within the past ten years, and I have never myself been fortunate enough to observe it. I do not remember to have noticed it in the fine collection of Dr. Burkitt, of Waterford, which contains many rarities, including one specimen at least

which that well-known ornithologist is unable to identify. This year has been a very barren one for many observers in Natural History, and my gleanings have been much fewer than in former years.—CHARLES W. BENSON (Rathmines School, Dublin).

UNCOMMON BIRDS IN NOTTINGHAMSHIRE.—A Common Buzzard was shot, on the 15th September last, at Rufford. Early in the same month, as some workmen at Nottingham were one morning proceeding to their work, they came across two Shags, or Crested Cormorants, flapping about in Cross Street, and after an exciting chase caught them both. They were taken to T. White, birdstuffer, who tells me they dived for fish in his tank, eating several; he kept them alive for two days, but, finding they “did not look like living,” killed and stuffed them. I have purchased them for my collection. Another was caught in a street close by, and a fourth was shot on Mapperly Plains. They were all young birds, possibly from the same nest, and having wandered away, got lost; or they may have been driven inland by a gale. Two male Common Scoters were shot on Thornton Reservoir, near Leicester, on the 18th September, and forwarded to me. Thornton Reservoir is four miles from Bosworth Field, which is about the centre of England.—J. WHITTAKER (Rainham Lodge, near Mansfield).

DISTRIBUTION OF THE CARRION CROW.—Allow me to point out a slight inaccuracy in your ‘Handbook of British Birds.’ It is there stated that the Carrion Crow is rare in the Eastern Counties. I think Essex is certainly an exception, as it is fairly common about here; and for some miles round Felsted, where I was at school, there was scarcely a wood where the nest of this bird might not be found. My brother only left last year, and he always found a great many eggs of the Crow as well as of the Sparrowhawk and Kestrel, and the year before last found a Hobby’s nest with four young ones.—M. VAUGHAN (Finchingfield, Braintree).

[The statement referred to was founded on the observations of several well-known naturalists in the Eastern Counties. See Stevenson’s ‘Birds of Norfolk,’ vol. i., p. 258.—ED.]

IMMIGRATION OF ROOKS AND OTHER BIRDS AT HARWICH.—On October 16th thousands of Rooks, Hooded Crows, Jackdaws, Starlings, and Sky Larks were seen coming in from the sea—the first migration observed this season. A Spotted Crake was picked up dead on the railway-line, having flown against the telegraph-wires. On the 12th October a specimen of Richardson’s Skua, in immature plumage, was shot on the Dovercourt shore; and, at the same place, a Snow Bunting was procured on the 14th.—F. KERRY (Harwich).

GREY PHALAROPE IN BEDFORDSHIRE.—A specimen of the Grey Phalarope was shot on October 6th by a farmer at Beeston, near Tandy,

in this county. It was rapidly assuming its winter dress. It was observed swimming about on a pond, and, as is usually the case, was remarkably tame. One was also obtained near here during the memorable immigration of this species in the autumn of 1866.—C. MATTHEW PRIOR (Bedford).

VARIETY OF THE SANDERLING.—On the 28th August I and a young friend observed a small white bird flying in a flock of about twenty others on the sands near Holy Island. We watched them settle, and approached the flock from different directions, having both agreed to shoot at the white bird when the flock rose. One bird only fell, which I picked up, an old Sanderling; the white bird "singled" from the flock flying a short distance on my friend's side, and when it rose again he killed it. It proved to be a Sanderling, but very curiously marked and in perfect feather, nearly all white; the centre of the head cream-colour, shaded to white, gradually and evenly marked there as elsewhere. The back is pale buff, and the outer edges of the outside primaries are rich cream-colour; an even dusky brown V-shaped mark on the back, and the other parts quite white; the beak and legs olive. It was very fat, and it was no easy matter to keep it clean. However, with great care, I set it up, and it is now as clean as can be. Sanderlings were common about this date. The old birds first arrive in August in flocks by themselves; they pass on, I presume, for I never see them after the end of the month, when the young birds arrive. They keep in separate flocks, and after a few days they also appear to pass on, for they are afterwards only met with occasionally.—C. M. ADAMSON (North Lesmond, Newcastle-on-Tyne).

SHORE BIRDS ON THE NORFOLK COAST.—On September 21st Mr. Gunn had a male Grey Plover, with a black breast only slightly broken up with white, from Yarmouth, which is a late date for it to have retained its summer plumage. A good many Knots and a few Pigmy Curlews have been shot at Blakeney during the last week. The Knots were like skeletons, having no fat at all upon them, while Sanderlings and Dunlins shot at the same time were in good condition. One Pigmy Curlew shot on the 18th, by Mr. Ford Barclay, had a cockle on its foot: the bird had evidently trodden on it when open, and been caught. A Tern was caught some years ago, near Lynn, in the same manner by a mussel, and other similar instances have been recorded. On August 11th I received eleven Knots in three-parts red plumage from Happisburgh.—J. H. GURNEY, JUN. Northrepps, Norwich).

SUPPOSED NESTING OF THE REDWING NEAR YORK.—Whilst out shooting on August 27th I killed a bird which, in the dim evening light, looked like a Thrush, but on examining it next day I found it was a young Redwing (moulting). The body was a good deal shattered, but the head was untouched, and showed the whitish line above the eye very well. The

colour under the wing also was very deep. Does not this clearly prove that a pair of Redwings have bred in the county, owing probably to the severity of the weather in the early part of the year?—J. BACKHOUSE, JUN. (West Bank, York).

BEE-EATER IN DERBYSHIRE.—On the 4th May last a pair of these beautiful birds were shot in the gardens of Stainsby House, near Derby, by James Hawkins. They were flying round some apple and cherry trees which were in blossom. The birds were in fine plumage, but rather damaged by the shot. One was purchased for the Nottingham Museum, and I obtained the other.—J. WHITTAKER (Rainham Lodge, near Mansfield).

REPORTED NESTING OF THE GOLDEN EAGLE IN SHETLAND.—While staying at Kirkwall, last August, I was informed by a gentleman, who had just returned from a tour in the Shetlands, that the Golden Eagle had nested and brought off its young on the island of Bressay, notwithstanding the repeated attempts of a shepherd there to shoot it. I made a point of asking whether it might not have been the White-tailed Eagle, but my informant seemed perfectly satisfied that it was the Golden Eagle. I should feel much obliged if any of your readers could give me any further particulars, as I cannot help feeling that it is far more likely to have been the White-tailed Eagle.—M. VAUGHAN (Finchingfield, Braintree).

[The late Dr. Saxby, long resident in Shetland, was unable to obtain any satisfactory evidence of the Golden Eagle breeding there.—ED.]

CORONELLA LÆVIS IN DORSETSHIRE.—I captured a fine example of this rare Snake on Bloxworth Heath yesterday, September 26th. Although I am very frequently walking about and entomologising on the heath, at all seasons of the year, it is now six or seven years since I obtained a specimen of it (Zool. 1872, p. 3113). The length of the example now recorded is exactly two feet.—O. P. CAMBRIDGE (Bloxworth Rectory).

BOAR-FISH OFF PLYMOUTH.—Since my last note (p. 429) I have had some conversation with Plymouth fishermen on the subject. They tell me that within a few years these fish have swarmed to such an extent as to have become a perfect pest, and that in many instances the trawlers have actually been obliged to change their fishing grounds in order to be out of their way. Indeed such immense numbers often get into the trawls, and and so great is their weight, that they are obliged to cut a large hole in the net to let them escape, together with all the more valuable fish they might have taken besides, finding it almost impossible to lift such a great bulk on board without carrying away their gear. On my telling one of these men that

the proper name was "Boar-fish," he answered, "And a proper name for 'em, too, sir, for they be proper bores to us fishermen; but we always calls 'em 'Cuckoo-fish.'" It certainly seems remarkable, and worthy of notice, that a Mediterranean fish considered rare not many years since should now appear on our coasts in such countless numbers.—JOHN GATCOMBE (Durnford Street, Stonehouse).

DEATH OF PROFESSOR GARROD.—It is with much regret that we have to announce the recent death, from consumption, of Professor A. H. Garrod, F.R.S., whose loss will be much deplored by all workers in zoological and anatomical science. In his capacity as Prosector to the Zoological Society, Prof. Garrod had opportunities as an anatomist which fall to the lot of but few, and how well he turned those opportunities to account is best known to those who have studied the result of his researches, as embodied in the many valuable papers contributed by him to the 'Transactions' and 'Proceedings' of that Society. For some time prior to his death, Prof. Garrod had been engaged upon a much-needed work on the Anatomy of Birds, in furtherance of which he was elected to share in the Royal Society's grant in aid of Scientific Research; but his failing health causing great anxiety to his friends, he was recommended to desist from work, and spent some time in the South of France in the hope that he might recover. This hope, alas! has proved vain, and the scientific world now deplores the death, at an early age, of one of the most clever and earnest workers of the day. His readiness to answer questions and impart information on the subjects of which he was so good a master will be long gratefully remembered by all who have had occasion, at one time or other, to seek his assistance. The announcement of his death only reaching us as these pages were going to press, we regret that we have been unable, in the short time at our disposal, to furnish, as we should otherwise have done, a complete list of Professor Garrod's publications.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

September 5, 1879.—J. JENNER WEIR, F.L.S., F.Z.S., Treasurer, in the chair.

Mr. Philip B. Mason exhibited specimens of *Harpalus oblongiusculus*, Dej., taken in August, 1879, at Portland. One specimen had been captured there last year by Mr. Harris; but at least a score had now been taken in this locality, thus confirming the claim of this species to a place in the British list. Mr. Mason also exhibited, on behalf of Mr. Gameys,

of Repton, specimens of *Euplectus ambiguus*, Reich., showing the difference between this and the var. "*duplo minor*" described by Thomson. The variety exhibited, which has not been before recorded in Great Britain, was taken at Repton in flood refuse during the late spring.

Miss E. A. Ormerod exhibited specimens of *Calandra palmarum*, forwarded by Mr. D'Urban, of Exeter, as examples of the injury caused by the so-called "cane-borers" to the sugar-canes of Demerara. One piece showed the commencement of the attack, "the preparatory holes made for it to insert its eggs" (as stated in observations from the colony); the second shows the complete destruction of the inside fibre of the cane, and in the third piece the cane was completely hollowed out. Miss Ormerod remarked that these specimens were accompanied by two living larvæ of the cane-weevil, which formed their cocoons whilst on the way, and availed themselves for the purpose, of the packing material; the inside of the cocoon being, as usual, of fine cane-fibres, but the outside consisting, in one case almost entirely and in the other partially, of the straw or grass (still with a few empty ears on it) in which the cane was packed. The difference in material is rather interesting, as it affords means of tracing the method of plaiting and arranging longitudinally as well as twisting the fibres. The pupa was found to be dead shortly after receipt, and was shown with the cocoon from which it was removed. A single specimen of lepidopterous pupa was also sent over, lying in the central gallery it had hollowed in a small cane-shoot little more than a quarter of an inch in diameter. This pupa was singularly active when received, moving at will for about an inch along its gallery; but though placed in an evenly warm and moderately damp atmosphere, and left undisturbed, excepting occasional examination, it appeared to be dead. The report of the Managers of the Great Diamond Plantation furnishes some good notes, in few words, of the general characteristic of the attacks of the three chief cane-borers:—1st. The lepidopterous larva (presumably of the *Proceras*) has only been found hitherto in growing canes and above ground. 2ndly. The larva of the *Calandra palmarum* is found in rotten canes; cane tops after they are old, though still growing; and in the stools below ground. The cocoons in which these insects lie in the chrysalis state are nearly always to be found at the extremity of the cane top deepest in the ground. 3rdly. The larva of the *Calandra sacchari*, which is distinguishable from the *C. palmarum* by its smaller size and colouring of dark brown and yellow ochre, instead of black, but similar in habits, and in forming an intricate and strong cocoon woven of fibre to protect it whilst in the pupal state. With regard to the cutting out of infested cane, and the value in product paying expenses, it is noted:—"Besides burning, a gang of men has been employed cutting out such young canes as show signs of the attack of the insects, and these have been thrown into canals and sunk under water. A good many insects are killed in this way, but a great many escape.

In dry weather it might be preferable to make them into heaps on the downs, and, after being allowed to dry a little, covered with dry trash or grass and burnt. This cutting out was commenced some six weeks ago; and during that time 246 acres have been gone over, and although experience is so short, it may be safely said that the young cane-stumps look stronger than they have done for a long time past, although they have had very dry weather on them lately. Fifty punt loads of tops and water-sprouts, which had shown signs of the attacks of the borers, have been brought home and ground, and the juice showing a density of $1042\frac{1}{2}$, after being neutralized by lime, was set up and distilled. Sufficient rum and megass were obtained to pay all expenses." Ants are of very great service, as they devour the insects when in the chrysalis state, and it is satisfactory to notice that they are on the increase. It is evident that to burn fields in which the small red or black ants are to be found in abundance is a mistake, as large numbers of the best friends of the canes must inevitably be destroyed by the fire. To entice ants and other insects known to be antagonistic to grub-life is of vital importance, and no trouble should be spared in getting them into the cane-fields.

Mr. McLachlan stated that the lepidopterous larva proving so destructive was probably no other than that of the moth noticed by Fabricius in 1794 as "*Phalæna saccharalis*," and which had been commonly noticed since his time in various West Indian and South American plantations. He agreed with Miss Ormerod that the only probable means of lessening the amount of damage was to be sought in the practice of uprooting and burning all infested canes the moment they showed signs of the presence of the larva; not by burning them on the ground, but by collecting them and destroying them by fire outside the plantations, by which means the risk of destroying the natural enemies of the borer would be avoided. From the accounts just read it appeared probable that the *Calandra* only came in after the canes had been rendered unhealthy, or were destroyed, by the larva of the moth, and thus acted the part of scavengers, completing the work commenced by the moth.

Mr. Jenner Weir exhibited a pair, male and female, of *Cicada montana*, taken in the New Forest, in July, 1879.

M. Ch. Oberthur communicated the following paper:—"Observations sur les Lépidoptères des îles Sangir et descriptions de quelques espèces nouvelles." Coloured drawings of some of the new species described were exhibited.

October 1, 1879.—Sir JOHN LUBBOCK, Bart., M.P., V.-P.R.S., President, in the chair.

The President first alluded to the loss which the Society had sustained by the death of Mr. William Wilson Saunders, F.R.S., who had been President in 1841, 1856 and 1857.

The President then announced that Lord Walsingham, in conjunction with other gentlemen, had placed at the disposal of the Council the sum of £100, to be awarded in two prizes of £50 each for the following subjects :—

1. The best and most complete life-history of *Sclerostoma syngamus*, Dies., supposed to produce the so-called "gapes" in poultry, game, and other birds.

2. The best and most complete life-history of *Strongylus pergracilis*, Cob., supposed to produce the "grouse disease."

No life-history would be considered satisfactory unless the different stages of development were observed and recorded. The competition was open to naturalists of all nationalities. The same observer might compete for both prizes. Essays in English, German, or French were to be sent to the Secretary of the Society on or before October 15th, 1882.

Mr. M'Lachlan said that, with the greatest respect for the liberal offer made to the Society by Lord Walsingham, he nevertheless considered the Council had not held sufficiently in view the objects for which the Society was instituted when they entertained his offer. The Society was now (as almost always) languishing for want of funds sufficient to enable it to efficiently carry out its purpose—the advancement of entomological science; and he thought that if this were properly brought under the notice of Lord Walsingham he might be willing to modify his offer so as to bring it within the scope of the aims of the Society. By accepting the offer as it stood he thought the Council had exposed the Society to the risk of ridicule. The subject belonged more properly to the Linnean or Zoological Societies. It was true that the subjects in which the Society was specially interested did not consist exclusively of Insects, but they were limited to that division of the Animal Kingdom classed under the comprehensive term *Arthropoda*, and in no case could the *Entozoa* come within that division.

Mr. Stainton remarked that when he heard an announcement made from the chair, in which the Latin names of the species occurred, he fully expected that, for the information of the younger members who were present, the President would have stated to what order of insects they belonged. If the creatures in question were not insects, he could not conceive what the Entomological Society had to do with them. Insects, Crustacea, Arachnida, and Acari came properly under the charge of the Society, but the Entozoa were quite foreign to its scope, and fell more strictly within the province of the Linnean or Zoological Societies, with which latter Society he believed Lord Walsingham to be connected. It was a case he considered of *ultra vires*, and when he used that expression he was in hopes that he should induce a lawyer whom he saw present to rise and say a few words on that text.

Sir John Lubbock stated that the offer for these prize essays had first been made to him by Lord Walsingham, and, as President of the Society,

he did not take upon himself to refuse what appeared to him a valuable opportunity of extending the knowledge of an obscure group of Annulosa, but had forwarded the letter to the Secretary, to be laid before the Council, by whom the offer had been accepted. He fully agreed with Mr. M'Lachlan and Mr. Stainton that these entozoic parasites could in no way be regarded as coming within the scope of Entomology proper; but he was of opinion that in accepting Lord Walsingham's offer a useful precedent was established for receiving future support from others who might be disposed to extend similar aid to the investigation of subjects coming more strictly within the province of the Society. In conclusion, the President stated that the Council were in the hands of the Society, if any member chose to put the objections raised to the acceptance of the offer in question into the form of a resolution.

Mr. Stainton said that he had no intention of moving any resolution on the subject. He thought the Council was the proper body to deliberate on the matter; but if a suggestion were made to Lord Walsingham that the development of Entozoa was a subject which came very properly in the province of the Zoological or Linnean Societies, but that to the Entomological Society the matter was altogether foreign, his lordship would be found quite ready to transfer his proposal to one of those Societies.

Mr. Pascoe observed that the subject was one which should be settled entirely by the Council.

Mr. C. O. Waterhouse remarked that in accepting this offer the Council could not be considered to have claimed for the Society any special knowledge of the subjects proposed for competition; they were simply placed in the position of having to award a certain sum placed at their disposal for essays, the quality of which they would be at liberty to refer for determination to any competent authority, whether in the Society or not. If the prizes had been offered by the Council, or to members of the Society only, there would have been good grounds for objecting to their acceptance, but as the competition was open to any person, whether a member of the Society or otherwise, the Council were only the means of communication between Lord Walsingham and the essayists, to which no objection could be raised.

Mr. Philip Henry Gosse, F.R.S., of Torquay, Devonshire, was ballotted for, and elected an Ordinary Member.

Mr. M'Lachlan exhibited specimens of an Hemipterous insect just received from a gentleman residing near Canterbury, and which, it was stated, was causing great damage to hops, being known to the growers as the "needle-nosed flea." It was stated that hitherto it had only appeared in a restricted area, but this year it occurred over many acres. The insect proved to be *Anthocoris nemorum*, and Mr. M'Lachlan suggested that it was on the hops in search of Aphides or other small insects, its habits being carnivorous, so far as is known. Hence the hop-growers were possibly asking advice as to the destruction of what might be one of their best friends.

Mr. M'Lachlan also exhibited examples of the larvæ of one of the *Embiidæ*, found by Mr. Wood-Mason at Jubbulpore on his return to Calcutta, crawling on the ground in the open, and also occurring under loose bricks; the latter habit being quite in accordance with that most generally attributed to the family, although one species (*Oligotoma Michaeli*, M'Lach.) had been found in a hot-house near London, in all its stages, and apparently injuring orchids. The species sent by Mr. Wood-Mason was probably *Oligotoma Saundersi*, Westwood.

Mr. M'Lachlan further called attention to the sculptured stones on the shores of Lake Léman, alluded to at two previous meetings, and which it had been suggested by Prof. Forel might be merely due to the action of trichopterous larvæ, apparently those of *Tinodes wæneri* (*larida*, Curtis). Mr. M'Lachlan had recently examined multitudes of these stones on the shores of Lake Neuchâtel, and under peculiarly favourable conditions, because recent engineering works had lowered the level of the Lake, and exposed many interesting phenomena. The stones, which (as in those of Lake Léman) were limestone, were very strongly sculptured, but in differing degrees, so as to lead one to suppose that all might not have been acted upon by the same agents, or that differences in the texture of the stone occasioned variety in the sculpturing. He was doubtful as to the ability of any trichopterous larvæ to occasion the sculpturing, and thought it more probable the result of the work of Mollusca, but there still remained much uncertainty as to its exact nature.

Mr. Waterhouse, with reference to injury done to hops, stated that he had recently inspected a hop garden in Sussex, in which great mischief had been done by a species of Homopteron (*Euacanthus interruptus*), probably assisted by an Hemipteron (*Lygus*). These punctured the leaves in which holes were afterwards formed, so that the surface was destroyed, and the supply of nourishment to the plants thus prevented. He was of opinion that *Euacanthus* was likely to have been the cause of the damage complained of by Mr. M'Lachlan's correspondent.

Mr. Pascoe exhibited an apparently new genus and species of *Acridiida*, remarkable for its aquatic habits. It was seen in some numbers hopping about on the surface of a pool near Pará.

The Rev. A. E. Eaton exhibited larvæ, pupæ, and cases of *Hydroptila* (restricted) collected near Val d'Illiéry, Vallais, and Sixt, Haute Savoie.

Sir John Lubbock exhibited a specimen of *Orchesella rufescens*, taken in Kent, being a species of *Colembola* new to Britain.

Mr. E. Boscher exhibited a coloured drawing showing the extreme forms of two varieties of the caterpillar of *Smerinthus ocellatus*, found feeding respectively on *Salix viminalis* (osier) and *S. triandra* (French willow).

Mr. Wood-Mason communicated a note "On the Specimens of *Narycius* (*Cyphonocephalus*) *smaragdalis*, figured on Pl. I., fig. 3 (male), fig. 4 (female), of Trans. Ent. Soc. 1878."

Mr. J. S. Baly communicated "Descriptions of Phytophagous Coleoptera belonging to the Families Chrysomelidæ and Galerucidæ, from Peru."

Mr. A. G. Butler communicated "Descriptions of two new Lepidoptera of the Family Sphingidæ."

Mr. C. O. Waterhouse read "Descriptions of two new Genera and Species of Coleoptera from Madagascar, belonging to the Families Tenebrionidæ and Cerambycidæ." Mr. Waterhouse also read a paper "On the Affinity of the Genus *Polycytenes*, Westwood, with a Description of a new Species."—R. MELDOLA, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

The Capercaillie in Scotland. By J. A. HARVIE BROWN, F.Z.S.
8vo, pp. 155. Edinburgh: Douglas. 1879.

THIS book was well worth writing, and Mr. Harvie Brown has written it well. We could have wished that while he was about it he had told us a little about the former existence of the Capercaillie in England, since there can be little doubt that it was once an inhabitant of our ancient pine-woods, a surmise which is strengthened by the fact that the Britons had a name for it, "Ceiliog Coed," and that its bones have been found amongst Roman remains at Settle. We have met with old grants (circa 1343—1361) of land, in the county of Durham, held by the tenure *inter alia* of paying "one wode-henne yerely" to the Bishop of Durham for the time being, indicating pretty clearly the "Ceiliog Coed," or Capercaillie.

But it was in Scotland, of course, that, prior to its extinction and reintroduction, it had its chief stronghold; and it was to be expected that Mr. Harvie Brown's remarks would relate chiefly to its history in that part of the British Islands where alone it is to be found at the present day. After examining the evidence concerning its extinction in Scotland during the latter half of the last century, he arrives at the conclusion (p. 28) that "in the absence of distinct data it is safer to accept the date of 1760 as that of the extinction of the original stock in Scotland." About the same date we are told it became extirpated in Ireland, the last survivors, according to Pennant, having been found at Thomastown, in Tipperary. In regard to its last haunts in England and Wales we are at present left in the dark.

Of the causes of the extinction of the species in Scotland Mr. Harvie Brown says but little. "The most likely factors" he believes to be "the probable destruction of great forest tracts by fire, the cutting down of the same by man as late as the days of Cromwell, and the wasting of the forest from natural causes, by the conversion of dry forests into bogs and morasses, and resulting from this the decrease of, and change in, the food of the species."

Rutty, in his 'Nat. Hist. of the Co. Dublin,' 1772, speaks of the Capercaillie as having been seen in the County Leitrim about the year 1710, but adds, "They have entirely disappeared of late *by reason of the destruction of our woods.*"

In 1827 or 1828 an attempt was made by the Earl of Fife to reintroduce this fine game-bird at Mar Lodge, but unfortunately the experiment did not succeed. A few years later, however, *viz.*, in 1836, through the instrumentality of the late Sir Thomas Fowell Buxton, and the co-operation of that fine old sportsman, the late Mr. Lloyd, of Scandinavian renown, a number of these birds were imported from Sweden, and turned out in the woods at Taymouth. The actual rearing by hand was not so successful, but in 1841 favourable reports were received of the successful hatching of eggs under grey hens, principally in the woods of Drummond Hill. They soon became fairly established, and about the year 1862 or 1863 the Marquis of Breadalbane estimated their numbers on the estate at over 1000 birds, while the head-keeper, who tended the birds with the greatest possible care, considered that there were over 2000.

At Taymouth, and all along the Tay Valley, as far as Dunkeld, Capercaillies, after becoming fairly established, increased in numbers rapidly for a number of years. The whole district was in every way admirably adapted to their habits, the Duke of Athole and Lord Breadalbane having planted considerable areas of their estates in the latter part of the last century, and in the beginning of the present one, with larch, Scotch fir, and spruce, thus forming for the restored birds the perfection of cover and food.

Mr. Harvie Brown has been at considerable pains to trace the direction in which the progeny of this new stock spread from the head-quarters at Taymouth; and by means of a circular, which he distributed amongst the principal land-owners of east-central

Scotland, and which was responded to in a very liberal spirit, he has been enabled to furnish some interesting particulars concerning the gradual increase and present distribution of the species. The evidence thus collected is arranged methodically and clearly, while a small map exhibits at a glance the districts (coloured red) wherein the Capercaillie may now be found.

The author's concluding remarks on the damage which the bird does to young trees by feeding on their growing shoots, and in its alleged hostility to the Black Grouse, are not the least valuable portions of his essay.

The Spiders of Dorset; with an Appendix containing short Descriptions of those British Species not yet found in Dorsetshire. By the Rev. OCTAVIUS PICKARD CAMBRIDGE, M.A., &c. From the 'Proceedings of the Dorset Natural History and Antiquarian Field Club,' edited by Professor JAMES BUCKMAN, F.G.S., F.L.S. Vol. I. 8vo, pp. 235, with three plates. Sherborne: L. H. Ruegg. 1879.

HAD this volume consisted of a mere catalogue of the species of *Arachnidæ* found in the county of Dorset we should have experienced some difficulty in expressing an opinion on its merits, for want of that special knowledge of a subject on which Mr. Pickard Cambridge is perhaps the best authority at the present day. The very excellent introduction, however, with which the volume is prefaced, takes it completely out of the category of mere lists of species, and furnishes material for a more lengthy *critique* than we can at present, for want of space, afford. In a future number we shall hope to deal with it more fully, and give some extracts from the pages of our author on a subject which hitherto seems to have attracted but little attention amongst naturalists. In the meantime it must suffice if we direct attention to the appearance of this recently-published volume, and recommend to our readers the perusal of the "Introduction" in its entirety. It furnishes an amount of information, clearly and intelligibly conveyed, which many, we feel sure, would be glad to possess did they know where to look for it.

As the Spiders found in Dorsetshire include upwards of two-thirds of those as yet known to be British, and as an appendix

will furnish a supplemental list with short diagnoses of the species not yet discovered within the limits of the county, the monograph, when complete, will include all the known British Spiders. Mr. Blackwall's large volume, published by the Ray Society in 1861—64, records 304 species; the present work already includes 510, and fresh additions are constantly being made to this total by the author and his fellow-workers in this special field of observation.

Transactions of the Norfolk and Norwich Naturalists' Society,
1878—9. Norwich: Fletcher & Son. 1879.

THE last part issued of these 'Transactions' (vol. ii. part v.) contains several papers of unusual interest, of which we may specially notice that by Mr. Southwell on "Norfolk Decoys." It will probably surprise many of our readers to learn that, in this county alone, Mr. Southwell has ascertained the former existence of no less than twenty-three decoys, while at the present day there are six still in working order. The statistics collected concerning the site and dimensions of these decoys, and the numbers of fowl annually taken, are very curious, and have furnished the writer with materials for an article which is interesting alike to sportsmen and naturalists. Under the head of "The Gannet City," Mr. J. H. Gurney, jun., gives an account of the Bass Rock and its feathered inhabitants from recent personal observation. No less than 1000 Solan Geese are said to be taken here annually, and the plucking is carried on by five or six women who are employed daily throughout the season at one shilling and sixpence a day each. The feathers are used for beds, and the eggs are taken for food. There are other sources of profit, however, besides the Gannets; Rabbits are plentiful, and the guano-grown grass affords capital pasturage for a score or so of sheep. So that the lessee who farms the rocks for the modest rent of twenty pounds a year from the owner, Sir Hugh Dalrymple, apparently makes a good thing out of it.

Mr. Cordeaux contributes "Some recent notes on the Avifauna of Lincolnshire," in which he compares the present condition of his county as regards the range and distribution of certain species with its former aspect as depicted by Pennant and Montagu, and

some of the older historians; while Mr. Stevenson, in his "Ornithological Notes," keeps us well informed of the latest news concerning birds observed in Norfolk.

The Society may well be congratulated on the publication of so many interesting papers as appear in the present part of these 'Transactions.'

A Dictionary of the Thames from Oxford to the Nore. By CHARLES DICKENS. Sm. 4to., pp. 268. London: published at the office of 'All the Year Round,' 26, Wellington Street.

UNIFORM in size with his 'Dictionary of London,' Mr. Dickens has just published a 'Dictionary of the Thames,' with maps of the river in sections. Its claim to be noticed in these pages rests upon the fact that in addition to the information usually supplied by guide-books, topographical, archæological, historical, and otherwise, it contains a good deal of Natural History. Articles on the Geology, Botany, and Ornithology of the Thames Valley, written by well-known specialists, will be found under these separate headings, and the Fishing is discussed both generally and in detail, the following species being separately treated:—Barbel, Eel, Gudgeon, Perch, Pope or Ruff, Roach, Salmon, Shrimps, Sturgeon, Trout, and Whitebait. The remarks on Thames Salmon will be found of special interest, particularly, of course, to anglers. The expulsion of this fine fish from the river dates apparently from the opening of the docks at the commencement of the present century. Faulkner, in his 'History of Fulham,' 1813, writes:—"The Salmon caught here are highly esteemed, and sell from 5s. to 12s. per pound. Only one was caught here during the last season. They have abandoned the Thames since the opening of the docks."

Of the articles which do not relate to Natural History those headed "Art and the Thames," "Etymology of the Thames," and "Poets and Poetry of the Thames," are particularly interesting, and deserve special mention. We have no hesitation in saying that a better shillingsworth in the shape of a handbook to the river is not to be found.

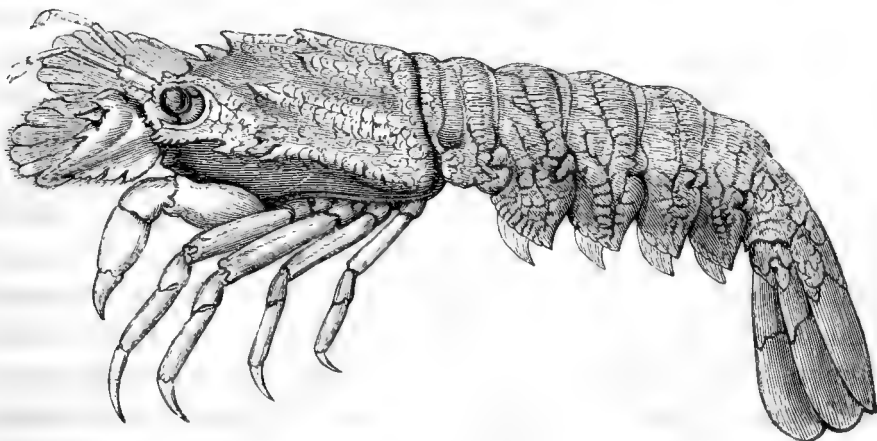
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SCYLLARUS ARCTUS.

ON SOME LITTLE-KNOWN FISHES AND CRUSTACEA.

By THOMAS CORNISH.

To the kindness of Professor Bell I am indebted for the identification of the first specimen which I obtained of *Scyllarus arctus*, the pretty lobster-like crustacean here figured. This was in 1865. He thought at the time that it was the first English specimen procured; but I subsequently ascertained from him, and from the late Mr. Jonathan Couch, that the latter gentleman had anticipated me with two specimens taken from the stomachs of codfish, and I believe I was further anticipated by Borlase, the historian of Cornwall, who mentions "a fine shrimp" (which he took at Longrock, in Mount's Bay), by a description which applies more nearly to *S. arctus* than to any other crustacean

with which I am acquainted. As this species has been neither figured nor described by Mr. Bell in his work on Crustacea, and as I have had opportunities of examining more specimens of this crustacean, alive and dead, than probably any other observer, I propose to describe the subject of the above woodcut, which I obtained last August, and which I succeeded in keeping alive for fifteen days.

This specimen, a female in berry, I took in my trammel while fishing on a bottom of fine shingle about half a mile off shore in about six fathoms of water. This was on August 7th. I placed it in an extemporised aquarium on a bottom of fine gravel, the water being entirely renewed twice a day. I did not feed it at all. It proved to be—as the late Mr. Jonathan Couch surmised, in writing me, it would be—very sluggish in its habits. In shape like a *Galathea*, without prehensile claws, and with all its legs covered by the carapace, it remained usually at rest on the bottom of the aquarium, or else slowly crawled about with its tail tucked in under it; but if suddenly disturbed it would exert a rapid and somewhat powerful back-spring action by quickly extending and recovering its tail-fin and tail, just as the Shrimp does. I think I detected it twice routing up the sand with its broad, rounded exterior antennæ, as if feeding; but I am not clear on the point, and possibly the action which I saw may have resulted from an instinct of defence, although of course it is extremely probable that the antennæ are thus used for feeding purposes.

Everything about the upper exterior of the carapace suggests defence, but not so much against attack as against wave injury. The eyes are sunk in deep sockets, and each is protected by three large and numerous small stout spines. Two rows of spines on each side of the carapace and one down the middle of the back protect the shell, which is in addition covered with hard scaly excrescences. The dorsal half of the tail is protected by similar excrescences. The broad exterior antennæ are each divided into an upper and lower lobe, the lower one jointed on to the upper one, at about one-third of its length from its base. Both lobes have independent lateral action and a downward vertical action, and are strongly ribbed. When spread in life they are the broadest part of the whole animal. The interior antennæ lie between the exterior, and are jointed in five articulations. They

can be folded up so as to be placed entirely under the protection of the exterior pair. All the legs have curved pointed single fingers, and none have any prehensile hand. The front pair of legs have a very strong arm and wrist and a stout claw. The second and the third pair of legs are longer than the first, and reach as far forward. The under surface of the carapace is protected by the same scaly processes as the upper.

When the animal lies in what is apparently its natural attitude, anchored by its three sets of foremost legs, and with every one of its legs under the cover of the carapace and its exterior antennæ spread in front and lowered to a level with the bottom, so as to form a shield, it looks as thoroughly and effectively on the defensive as well can be. In front of the working fore-legs there is a pair of small appendages, in appearance somewhere between legs and pedipalps,* furnished with ciliated terminations, and used, I imagine, for sweeping the very small atoms of food on which the animal exists into its proper mouth.

The prevailing colour of the animal is reddish brown, with cross-bars of dull coral colour, pointed with ultramarine blue across the interstices of the joints of the tail. The stalks of the eyes are dull coral colour, and the eyes themselves very large.

Of the two specimens now lying before me,† the larger measures 4 inches from the extreme point of the external exterior antennæ to the bend of the tail, and $1\frac{3}{4}$ inch across the broadest part of the exterior antennæ, with $1\frac{1}{2}$ inch between the exterior spines of the eyes; and the smaller $3\frac{1}{2}$ inches over all as before, $1\frac{3}{8}$ inch over the broadest part of the antennæ, and $1\frac{5}{16}$ inch from spine to spine outside the eyes.

[We have shown these observations to Mr. E. J. Miers, of the British Museum, who has paid special attention to the Crustacea, and he has favoured us with the following note:—"Of recent years several occurrences of this species have been recorded in the British Channel. Mr. Spence Bate (Ann. Nat. Hist. ii. 1868, p. 117) mentions its occurrence at Penzance and near the entrance of Plymouth Sound; and specimens are in the collection of the British Museum from Mount's Bay, Cornwall, and the island of

* [These are the first maxillipedes, which are pediform.—ED.]

† Only remains of specimens, I am sorry to say; both were taken alive and in berry, but in noting these details I have ruined both of them.

Guernsey. It is very common in the Mediterranean, and occurs also on the coast of Portugal, at the Canaries, and Madeira. Dana, it should be noted ('Crustacea of the U.S. Exploring Expedition,' 1852, xiii. p. 516), has, with good reason, placed the *Scyllari* of Milne-Edwards' first section in a separate genus, to which he has applied the name of *Arctus*, and the *Scyllarus arctus* of authors, which is the type of the genus, is named by him *Arctus ursus*."]]

Syngnathus brevipinnatus.—In 'The Zoologist' for 1872 (page 3274) I noted the occurrence of a rare *Syngnathus*, new, I believe, in British seas. On the 19th August last I took another specimen in my trammel in Kenegie Bay here in about six fathoms water. Beyond noting again the beautiful vertical markings of the fish, I have nothing more to add to my former description. This specimen made and retracted—at will, apparently—a queer little projection under its gills, having the appearance of a tiny jibsail with its foot forward.

Scyllium catulus.—This fish, the Spotted Dogfish, is known here as the "Land-dog." I caught two in August last, the smaller of which was less than a foot in length over all.

Pagrus vulgaris.—A specimen of the Braise, or "Becker," was brought to me on the 16th August, caught in Mount's Bay. It was beautiful in colour and in excellent condition. I cannot agree that it is by any means a common fish. In all my fishing excursions I have not seen a dozen specimens. Couch states that this fish is migratory in its habits, and its visits are confined to the summer and autumn, leaving us on the approach of colder weather at the beginning of winter.

Motella vulgaris.—On the 20th August last I procured a female Three-bearded Rockling close inshore, full of roe partially matured.

Motella quinquecirrata.—A specimen of the Five-bearded Rockling was taken on a small hook off the rocks on the same day. This species, as a rule, is not found in such a depth of water as the Three-bearded Rockling. The most singular fact in connection with it is its habit of nest-building, the nest wherein the spawn is deposited being invariably formed of the common coralline, *Corallina officinalis*, thrust into some cavity or crevice of a rock close to low-water mark. It is well described by Couch (vol. iii. pp. 108, 109).

Galathea Andrewsii.—On August 22nd I took an example of this species on the roots of some sea-weed in the trammel on our usual six-fathom ground.

Doris tuberculata.—At the same place and time.

Carystes cassivelaunus.—From the stomach of a Bass on the same day.

Atelecyclus heterodon.—Same day. I found two very small specimens in a boat which had been “crabbing” in deep water.

Lepadogaster cornubiensis.—Under a stone amongst the shingle at low water, on August 22nd, we took a specimen of the “Cornish Sucker,” so named because first noticed in this part of England, although now known to be widely distributed. It is generally found in shallow water, and fastens itself to one place, without moving, for hours together. It preys on the smaller Crustacea, which it swallows whole. Full-grown specimens measure four inches in length.

THE BIRDS OF DUBLIN AND WICKLOW.

By H. L. Cox, M.B.

(Concluded from p. 454.)

RING DOVE.—Numerous in the wooded districts. Their numbers increase in the autumn and again in early spring. Whether they gather into large flocks or move farther south, I cannot say; but they do not seem so numerous in the winter as before and afterwards.

PHEASANT.—A few stragglers may be met with about the country that have strayed from preserves.

GROUSE.—Numerous in the Dublin and Wicklow mountains.

PARTRIDGE.—Not very plentiful, although I have shot them several times within a mile and a half of Dublin.

QUAIL.—I once heard a Quail calling in a field between Malahide and Donabate, and on another occasion I heard one near the Vartry Reservoir; on both occasions in the spring.

COMMON HERON.—Abundant during spring and autumn.

CURLEW.—I have met with this bird during every month in the year along the sea coast. Those I have shot in the latter part of spring and early summer are small birds with extraordinary long

bills, which I conclude are barren old birds. They are common from autumn to spring; most abundant in autumn. I have heard and seen them in the Wicklow mountains in spring and summer. Though never able to find a nest, I think they breed there.

WHIMBREL.—I have met with this bird in spring and autumn; and in spring it is very common. In May it may be seen at Clontarf in considerable numbers, and any night during that month may be heard flying over Dublin. In autumn it is not nearly so numerous, and, though it may be heard passing over at night, the flocks are not to be seen on the shores. I met with one on April 1st, 1878, at Dollymount—the earliest date I have met with it in the spring.

WOODCOCK.—A regular winter visitor, in variable numbers. I met with one in May, 1873, near Lough Dan, where a friend found the nest containing four eggs, hard set. I have seen other eggs that were taken in that neighbourhood, and have heard of the birds being seen there during summer.

COMMON SNIPE.—Resident, and is increased by foreign arrivals in autumn. They breed in considerable numbers all over County Wicklow, and may be seen and heard drumming over nearly every suitable spot, particularly in the neighbourhood of Roundwood, but the nests are difficult to find. In hard weather almost all the Snipe met with are home-bred birds. One would be inclined to think these would be the first to migrate; but I have noticed here, as well as all over Ireland, that the longer snow and frost last, the smaller is the proportion of foreign birds killed; thus pretty well proving that Snipe bred in Ireland do not migrate to anything like the extent one would suppose. I am inclined to think they merely shift their quarters from one part of the country to another. •

JACK SNIPE.—A regular winter visitor; more numerous towards the end of November and beginning of December than at any other time.

BAR-TAILED GODWIT.—Common. A few may be met with in August, the breast still buff; after this they increase each moult till November, when hundreds may be seen along the coast. In mid-winter the flocks are larger on the shores at Shetton, Dollymount, and Clontarf. In severe winters fewer remain, hard weather driving them farther south. In early spring there are always fresh arrivals, in small flocks; these have nearly all

disappeared by the end of April ; two or three stragglers sometimes remain a few days later. A pair stayed through nearly the whole of May, 1878. I shot them on the 25th ; they were male and female, and still had the light breast. The eggs in the female were about the size of B shot. This is about the latest date at which I have met with them.

REDSHANK.—Common, but not so numerous as it used to be some six or seven years back. It is most frequent late in autumn and in winter. I have never found it breeding in either county, though I once saw a pair at the end of April near the source of the Vartry River.

GREENSHANK.—A regular autumn visitor to some parts of the coast, though in some seasons in much smaller numbers than others. In 1874 there was hardly one to be found, whereas in 1877 there were considerable flocks. I saw one flock of from thirty to forty at the end of October, that year. I have met with them nearly everywhere along the shore ; but they are always most numerous at the inlet about half a mile north of Donabate. An odd one sometimes stays through the winter, and I have once or twice seen or heard one during the vernal migration.

COMMON SANDPIPER.—A regular summer visitor, and a pair or two may be met with quite close to Dublin, on the Liffey or Dodder. I have seen it along most of the streams, and have found the nest occasionally.

DUNLIN.—Common from the end of August till the beginning of May, remaining till the breeding plumage is almost assumed.

CURLEW SANDPIPER.—I have only met with this bird once in this district. Towards dusk on the 19th September, 1874, while walking along the sand outside the Bull, I saw a pair running in the direction of the bent, in which they crouched. One of these I captured with my hat ; the other escaped. I never again saw any in this neighbourhood, though I often watched for them.

PURPLE SANDPIPER.—A very scarce bird on the Dublin and Wicklow coasts, though a few pass every year. In October, 1876, I saw four or five about Ireland's Eye. On another occasion I saw a pair on the shore some miles north of Malahide. This bird frequents particular kinds of rock which are not found on the coast here, *viz.*, trap and basalt.

KNOT.—Abundant all along the coast. When just arrived in August it is so tame as almost to allow one to catch it. I have

frequently thought it must be a wounded bird which could not fly. During winter very large flocks may be seen, after the ebb has set in, flying about on the North Bull, at Malahide, Donabate, and, at low water, passing the Pigeon-House Fort. These birds are among the first to leave in spring; the large flocks have mostly disappeared before the end of March.

TURNSTONE.—Numerous in autumn and late spring. It is nowhere abundant; but on Ireland's Eye, in September and October, I have met with it in larger flocks than anywhere else.

OYSTERCATCHER—Large flocks may be seen in winter and spring near the Pigeon-House Fort and on the North Bull. I have seen them about Ireland's Eye, Lambay, and Howth in spring and summer, so I suspect that a few breed there.

GREY PHALAROPE.—I shot one on the North Bull on the 9th September, 1879—the only one, I believe, obtained in the neighbourhood for many years.

SANDERLING.—Passes regularly twice a year, about September and May. They remain, on their passage north, until most of them have assumed their breeding plumage, when they congregate in very large flocks. In autumn they are more numerous, but in smaller parties.

GREY PLOVER.—A regular autumnal visitor, but most of them pass on before winter, the few that remain disappearing very early in spring. As I have never met with any on their way back to the north, I fancy they must take some other route.

GOLDEN PLOVER.—Most plentiful late in autumn and early winter, except in mild winters, when they remain. Their numbers increase again in February, and in the Wicklow mountains I have found very large flocks in March and April; in the latter month all with the breast partially black, and usually tame. I have heard their note and seen odd ones later on, when they must have been breeding.

GREEN PLOVER, or PEEWIT.—Breeds abundantly in parts of Wicklow, and a few in County Dublin.

RINGED PLOVER.—I have found the eggs of this bird on the North Bull, on the Velvet Strand, Portmarnock, at Malahide, the Pigeon-House Fort, and other places. It breeds all along the coast, but nowhere very plentifully. The nests are always difficult to find.

WATER RAIL.—This I consider a scarce bird, having met

with very few. They are certainly difficult to flush, and many are missed from their habit of running, aided by the nature of the ground they frequent. In a swamp near the Sugar Loaf I saw two of these birds several times in March, 1870, and I have once or twice met with one in other parts of Wicklow.

LANDRAIL.—A regular summer visitor in variable numbers.

WATERHEN, or MOORHEN.—Common. I have met with it along almost every stream, canal, or wet ditch in both counties. It increases in numbers, I fancy, in winter.

COOT.—I have seen a few on the Vartry Reservoir in early spring, and in winter at the upper part of the Malahide estuary, also at the one near Donabate, and on the Swords river in April.

SWAN.—In January, 1870, when lying on the low part of the North-Bull wall, waiting for a pair of Mergansers to come within shot, I was startled by hearing a bullet whizz over my head. I looked about me without raising myself much, when I saw a Swan crossing the wall below me, and three sportsmen some hundreds of yards on the other side. They fired several balls, but as I was no longer between them and it I was able to watch the bird, which flew in the direction of Howth. Where it came from or went to I do not know, for though I looked for it for a week after I never saw it again. The following winter, about Christmas or a little after, three stayed for about ten days between the Bull and the shore, generally near the Sutton end. These I often thought were escaped tame birds. In April, 1875, a Swan was pointed out to me on the water between the Pigeon-House Fort and Kingstown Harbour, but by the time I had rowed round the Lighthouse it had vanished. In April, 1876, when about five or six miles straight out from the mouth of the Liffey, a flock of birds were seen on the horizon, flying in a northerly direction, which turned out to be Swans when looked at through a glass. These are the only Swans I have seen in the district. I cannot say of what species they were—most probably Bewick's Swans.

WHITE-FRONTED GOOSE.—In March, 1873, a flock of thirty-seven of these Geese stayed for a few days about the old targets on the North Bull, generally on the water. In January, 1874, I saw a single Goose flying over the Bull Bridge. It seemed to alight at the north end of the Bull, and was probably a White-fronted Goose.

BRENT GOOSE.—A regular winter visitor to all the estuaries along the coast, but does not come close into Dublin Bay in any numbers till February, though a few are generally to be seen about. I shot one of a flock as late as May 5th, and I have seen them up to the 15th, but only single birds or a pair as late as this. Its numbers increase all along the coast towards the end of January and February.

SHELDRAKE.—Appears in October in small flocks, which generally remain until after Christmas, when their numbers increase. I have observed the largest flocks in March and the beginning of April, after which those that remain are generally paired.

WILD DUCK.—Most plentiful in winter, but even then not numerous. I have found it breeding in several parts of Wicklow.

TEAL.—Most plentiful in winter. I believe a few breed in Wicklow, as I have found it paired and unwilling to leave a certain spot; once near the source of the Vartry river, and again on the bog behind the Sugar Loaf, both in the latter part of May, 1875, but I could not find a nest.

PINTAIL.—In January, 1872, I saw a pair with some Widgeon in Dublin Bay, and again in January, 1873, I saw a single bird with Widgeon.

SHOVELLER.—One night in January, 1872, I shot a drake out of a flock of four, below the targets on the North Bull. In January, 1874, I winged a drake out of three that were crossing the Bull wall, but lost it. These are the only birds of the kind I have met with myself, but I saw another which had been shot on the night I obtained the first-mentioned bird.

WIDGEON.—By far the most common duck in the district. In hard weather, as in December, 1878, their numbers increase to a wonderful extent. I have seen small flocks at the end of April.

SCAUP.—Met with sparingly in all suitable places. There are generally some in or about the mouth of the Liffey. They are most numerous in February and March.

TUFTED DUCK.—I have seen some at Malahide, and off Clontarf I have twice obtained one; but it is very scarce.

POCHARD.—I have noticed flocks of this bird early in October, when scarcely any other of the duck tribe have arrived. In 1877 they were unusually numerous, but only stayed a short time. They are now scarce in winter, but used to be more plentiful.

GOLDENEYE.—Numerous everywhere along the coast, and as usual the young and female birds are in the majority. At the end of March or beginning of April, in most years, there is an increase in the number and size of the flocks.

EIDER.—About the winter of 1869 or 1870 some of these ducks came into Dublin Bay, but soon left; they were very wild. I believe one was killed and preserved. I saw a pair on the 4th November, 1876, when I fired at the old drake as the pair passed over my head, but did not stop it.

RED-BREASTED MERGANSER.—Decreasing in numbers all along this coast. Years ago I have seen flocks of five or six commonly, and of thirty or forty occasionally. During 1877 I saw but one large flock and only a few stragglers, and still fewer in 1878. In May, 1877, when fishing in the River Annamoe, I saw five Mergansers; they were always within a limit of a mile and a half. Later on in the same month one had disappeared, and two pairs were still there; these remained until the middle of June, and I thought they were breeding somewhere along the river, but never found a nest.

GOOSANDER.—A scarce bird, though I have seen it several times. In January, 1871, there was one constantly diving along the Clontarf shore. I once got a long shot at it, but it dived at the flash and rose far out of range. During the winter of 1871-72 three frequented the same neighbourhood. I once saw a single bird near Donabate; I think it was in the winter of 1874-75. At the beginning of December, in the same winter, three appeared for a week or ten days off Clontarf.

CRESTED GREBE.—In the winter of 1870-71 I saw one of these birds near the Pigeon-House Fort, and hunted for it for some hours, but never got a fair shot at it, though it was fired at several times with a heavy gun; the ebbing tide ended the chase at last, as our boat grounded.

DABCHICK.—I once saw three of these birds on the sea near the Lighthouse at the mouth of the Liffey. I have constantly seen them at Malahide and Donabate; but they do not frequent the sea on this coast in winter, as they do in the West, where dozens may be seen at once almost any day. On the Vartry Reservoir a number may always be seen in spring and summer, and isolated pairs in other suitable spots where they can breed.

RED-THROATED DIVER.—The commonest of the three Divers.

I have seen it all along the coast; but it is most plentiful in April in Dublin Bay, where it remains till about the 10th or 12th of May.

BLACK-THROATED DIVER.—The scarcest of the three Divers. I have twice met with it in winter, but it is more frequent in spring. On the 13th May, 1876, I got a long shot at one in full summer plumage, but it escaped through the wire cartridge balling. On the 21st April, 1877, when walking towards the Lighthouse, one rose beside me within ten yards, not showing any alarm, and continued to dive and rise in nearly the same place for some time. This bird had the black throat, and was in splendid plumage. I saw it almost every day for ten days after this about the mouth of the Liffey.

GREAT NORTHERN DIVER.—A regular winter visitor, but, like the others, a larger number are seen on their northern passage. The number is somewhat regulated by the wind; the more easterly and the stronger it is, the more numerous this and the other Divers are in Dublin Bay in the spring.

GUILLEMOT.—I have met with this bird in March occasionally, but in April and May it is fairly numerous, generally remaining about Dublin Bay until it has assumed the chocolate head, when it departs for its breeding haunts. During summer scarcely any are to be met with nearer than Lambay, where a few may be seen. They again appear on their autumnal migration.

BLACK GUILLEMOT.—A few breed round Howth Head. I have seen from two to five pairs there every year, but in 1878 I only noticed one pair. I have also seen them in Dublin Bay in autumn and winter in small flocks.

RAZORBILL.—More numerous in spring than any other time. In April and May flocks of from twenty to thirty may sometimes be seen on the Liffey, from the Pigeon-House Fort down to its mouth, and also outside. A few stay all summer. There is an increase in their numbers in autumn, but not so great as in spring. I have obtained one or two every month through the winter. East winds and frosty weather always bring them in.

PUFFIN.—I have only once or twice seen this bird off the Dublin coast, and always in the spring. The few I have seen were always north of Howth, near Lambay.

CORMORANT.—Disappears almost entirely in April, when only stragglers are met with, until September, after which they

increase in numbers till about February or March, when large numbers may be seen. A few breed on Ireland's Eye and Lambay.

SHAG.—Seldom observed along this coast. I shot one at the mouth of the Liffey in April, and have seen them in Dublin Bay, near Ireland's Eye and Lambay, generally in autumn and winter.

GANNET.—When crossing in the steamers or yachting, during spring, summer and autumn, a few of these birds may be seen some miles out to sea. During a long continuance of east winds, in April, I shot one while feeding in the Liffey near the Pigeon-House Fort.

ARCTIC TERN.—A regular spring and autumn visitor, in some numbers, but almost all pass on north after a stay of three or four weeks. This is by far the commonest Tern during spring.

COMMON TERN.—Like the last-named, a spring and autumn visitor. Along the Dublin coast, as far as my experience goes, this bird is scarce compared with the Arctic Tern, nor is it so partial to salt water.

BLACK TERN.—In a stiff easterly breeze during the last week in April, 1877, one of these birds stayed a couple of days in the Liffey, near the end of the North Wall.

LESSER TERN.—A regular spring and summer visitor. I first noticed it in 1875, when on May 19th I saw two birds going before a squall; on the 22nd, just a little after daylight, I got a glimpse of three, and on the 24th procured one. A few days later a large number of these birds came in and about the Liffey. I found nineteen pairs of them breeding in Co. Dublin that year, and took a few eggs. I believe they have since been found breeding on the Wicklow coast. Some years only five or six pairs come; the largest flock I have seen at once was forty-five.

NODDY TERN.—I was once lucky enough to see one of these birds, but failed to procure it in consequence of having put in a cartridge of No. 12 shot for a Sanderling. It was at the mouth of the Liffey, about 7 P. M., May 12th, 1877, perfectly calm—not a cloud in the sky, although there had been a stiff S.E. breeze all day. The bird flew in from the bay, close past the boat; I fired at it, and it flew on badly wounded and fell somewhere near the Battery on the wall above the Lighthouse. The tide was low at the time, and I suspect it fell among the large stones covered with long dark sea-weed, and was probably found by one of the

hungry rats with which this wall abounds. We looked till darkness ended our search, but never succeeded in finding it.

ROSEATE TERN.—I believe I recognised one of these birds, amongst a flock of Arctic and Lesser Terns, feeding near the Lighthouse, one morning in May, 1876.

LITTLE GULL.—I saw one feeding with a number of other Gulls, chiefly Blackheads and Kittiwakes, on the Liffey at Kingsend, on December 6th, 1876. It came quite close to us several times, a westerly gale blowing at the time. I never saw it afterwards, though it remained about for a week, and a friend of mine saw it on three different days, and recognised it from having once obtained one himself in Scotland.

BLACK-HEADED GULL.—Common all the year round, except from June till about the end of August, when the greater number retire from this locality, returning when they have nearly lost the black head, and leaving when or soon after they get it.

GREAT BLACK-BACKED GULL.—Formerly much more numerous. There are always a few pairs and small flocks of four or five along the coast, but these are nearly all immature birds. In early spring I have noticed large flocks occasionally on the North Bull and near Malahide, but these do not usually make a long stay,—a change of wind occasionally taking them off.

LESSER BLACK-BACKED GULL.—I have met with immature birds during winter, but they are not seen in any number until spring. Towards the end of March a few arrive, and in April large flocks may be seen all along the coast. They again diminish in numbers in May. I have come across an odd pair now and then in June and July out in Dublin Bay and farther north. They appear again, on their return south, in August and September.

HERRING GULL.—Breeds round Howth Head, on Ireland's Eye, and Lambay, and seen at all seasons along the coast. In spring a good many may be found about the North Bull.

GLAUCOUS GULL.—During January, 1871, a large fish was washed up on the north end of the Bull, and I noticed one of these Gulls constantly at or about it for a week or ten days, when it disappeared. It was very wild, and I and a friend made many fruitless attempts to get within shot.

COMMON GULL.—During winter and early spring I have always found this bird most numerous, though there are generally a few about.

KITTIWAKE.—Common. Its numbers are greatly increased in April and May by fresh arrivals, which disappear by June. It breeds on Lambay.

SKUA.—I never obtained a Skua along this coast, though I have often seen them in Dublin Bay, near Bray Head, Ireland's Eye, and farther up the coast, always in autumn. They were probably Richardson's or Buffon's.

MANX SHEARWATER.—An uncertain spring and autumn visitor, although in some years there are thousands. In May, 1875, Dublin Bay was literally full of them; in 1877 I could not get a single specimen.

ERRATA.—P. 451, line 9 from top. The statement having reference to the occurrence of the Wood Wren in Co. Dublin should have been Editorial. P. 453, line 11 from bottom, for "last winter" read "in the winter of 1877—8." P. 454, line 16 from top, for "it is found" read "it is not found."

OCCASIONAL NOTES.

ORIGIN OF THE NAME "PUSS."—The cat was worshipped in Egypt as a symbol of the moon, not only because more active at night, but from the priests conceiving that the contraction and dilatation of the eye afforded an emblem of the increase and decrease of the moon's ever-changing orb. In the British Museum may be seen several figures of the cat-headed goddess Pasht, under which name the moon was worshipped by the Egyptians, Pasht signifying the face of the moon. "Pasht" is compounded of the consonants, P, SH, T; T is the Coptic feminine article, which, being omitted, the name is reduced to P.SH, but the aspirate SH, should be the tenuis S, and then the word would be P S, as in Hebrew, which may be pronounced "Pas" or "Pus" (Puss). It thus appears that our familiar name for the cat can boast of a very high antiquity.—J. E. HARTING.

RED FIELD VOLE IN DEVONSHIRE.—A second specimen of the Red Field Vole, or Bank Vole, *Arvicola glareolus* (Schreber), was brought to me on the 7th November by Mr. A. Dudley, of Ide, near Exeter. A careful examination of the molar teeth established the identity of the species, which may now be added with certainty to the Devonshire fauna.—W. S. M. D'URBAN (Curator, Albert Memorial Museum, Exeter).

LONG-TAILED DUCK IN CORNWALL.—I have never heard of the Long-tailed Duck in Cornwall in its full plumage, but it occasionally occurs in winter in its immature form, without the elongated tail-feathers. On the

30th October one was sent me from an inland parish, some miles from the sea, and—from its size and the greater intensity of the dark brown dorsal plumage—I should think it will prove to be a male.—EDWARD HEARLE RODD (Penzance).

SHOVELLER AND BAR-TAILED GODWIT AT REDCAR.—On August 2nd I shot a female Shoveller, *Anas clypeata*, at the Tees-mouth. It was one of a brood which had evidently been reared in the locality, and several others were obtained in a neighbouring marsh. On the same day I also procured a fine specimen of the Bar-tailed Godwit in full summer plumage, one of a pair which appeared unusually early, the large flights not arriving until the end of August or beginning of September.—T. H. NELSON (Redcar).

ORNITHOLOGICAL NOTES FROM WEST CUMBERLAND.—A Peregrine was seen last March near Hall Bolton, in Gosforth parish, by a gamekeeper, who was sufficiently near the bird to distinguish a white feather in its left wing. I heard of a Raven's nest on Skiddaw, and on March 26th, after a toilsome climb through bitter sleet and snow, reached it and found six eggs. The two specimens I took were exceedingly hard set. Soon after I heard that three young Ravens had been taken from another nest on Skiddaw, and were for sale. I sent for one of them, and kept him for about a month, at the end of which time he got loose, and, after once or twice circling round above the house, made off for the mountains, where I trust he still lives. From a Buzzard's nest on Miterdale Head Crag, in Eskdale, a perfectly white egg was taken, on April 6th, and sent to me. There were two more nests near. A pair of Goosanders were seen on Wastwater on April 22nd; the duck, I regret to say, was shot and eaten, and the drake soon left. The Swallow was first seen on April 26th, and the Cuckoo first heard the following day. On April 28th some eggs of the Common Snipe, hard set, were brought to me. These birds breed here in increasing numbers every year. The Landrail was first heard on May 11th, and on May 13th I found a Grey Wagtail's nest containing five eggs. A female Golden Oriole was shot in the adjoining parish of Irton in 1857, and a Hoopoe was killed at Calder Abbey, Beckermont parish, in 1851, both of which were preserved. A Solan Goose, rare in this district, was shot on the coast at Braystones last winter. After the late severe gales I found several Puffins dead on the beach, which had evidently been blown and washed across from the Isle of Man. I hear, on good authority, that a pair of White-winged Crossbills were observed several times in the Hall Santon Woods, in Irton parish, in the summer of 1878. The Common Crossbill is not uncommonly seen in the larch woods at Hall Santon.—CHARLES A. PARKER (Gosforth, Carnforth):

“NYNMURDER” A NAME FOR THE BUTCHER-BIRD.—I venture to suggest that the derivation for this term given on p. 404 (footnote) is not

altogether correct, and that "nynmurder" is equivalent to the German name "neuntödter," which I believe is applied both to *Lanius excubitor* and to *L. collurio*, and was embodied by Boie in the generic name "*Enneoctonus*," proposed by him for the latter species. The German term is founded on the popular idea (still current in Hanover) that the Butcher-bird slays and impales nine victims every day.—J. H. GURNEY (Northrepps Hall, Norwich).

ALPINE SWIFT AT FINCHLEY, MIDDLESEX.—I have lately received full particulars relating to the occurrence of an Alpine Swift, which was killed at Finchley during the first week in August, 1860, by Mr. Bates, farmer, of that place. He tells me that he was looking for a hawk which he had previously seen, and was standing with his gun in his hand, when he saw the bird coming towards him at a great height. From the great length of its wings and its way of soaring, he mistook it for the hawk for which he had been waiting, and as soon as it had passed overhead he fired at it. The shot took effect, and the bird slowly fell to the ground in the Islington Cemetery, in the Finchley Road, about a hundred yards from where it was shot. He had the bird set up, and it is still in his possession, but he did not know what it was until I told him, on my attention being called to it by a friend who had seen the bird, but was equally ignorant of the species.—W. J. STERLAND (New Southgate).

SCOTER AND SHAG IN NORTHAMPTONSHIRE.—The female Scoter shot in Northamptonshire, on August 20th (p. 427), was doubtless the partner of my bird obtained, the day before, at Shefford, in Bedfordshire. A Shag has been recorded once or twice from the neighbouring county of Oxon, and it seems a curious fact that when these birds and Cormorants do come inland they often perch on steeples, no doubt considering them the best substitutes for rocks.—C. MATTHEW PRIOR (Bedford).

SHORE LARK IN CORNWALL.—Two very prettily marked specimens of this Lark were shot a day or two since in St. Monyn, a parish not far from Padstow, on our north coast, and adjoining Trevose Head. The black and yellow markings about the head, chin, and sides of the head are well shown, and I was surprised to see the yellow tone so developed, as Yarrell, I think, speaks of this colour fading twenty-four hours after death.—EDWARD HEARLE RODD (Penzance).

CHANGING THE COLOUR OF FEATHERS IN LIVE BIRDS.—It is stated, in Fletcher and Kidder's 'Brazil,' that the Indians have a curious art by which they change the colour of the plumage of many birds. They pluck out a certain number of feathers, and in the various vacancies thus occasioned infuse the milky secretion made from the skin of a small frog. When the feathers grow again, they are of a brilliant yellow or orange colour, without

any mixture of green or blue, as in the natural state of the bird; and, it is said, the yellow feather will ever after be reproduced without a new infusion of the milky secretion.—J. E. HARTING.

LATE NESTING OF THE YELLOWHAMMER.—On August 28th a friend of mine found a Yellowhammer's nest containing two eggs. The bird subsequently laid two others, and sat upon three, one having been accidentally broken. Is not this unusually late, even allowing for the backwardness of the season?—ARTHUR BEALE (Chiddingstone).

DOTTEREL IN NORTH DEVON.—Towards the end of last May a trip of Dotterel visited the neighbourhood of Barnstaple. Three of the birds were shot and brought into the town. It is only at very long intervals that the Dotterel is seen in the West of England.—MURRAY A. MATHEW (The Vicarage, Bishop's Lydeard).

FULMAR PETREL AND TERNS AT REDCAR.—On October 16th two Fulmar Petrels were found on the sands. One was taken alive opposite Coatham, and is now in my possession; the other was picked up east of Redcar. Terns remained with us very late this year; on the 17th there was a large flock at the Tees-mouth, and a friend of mine shot two examples of the Arctic species. On the 23rd I walked close to a small flock of six sitting on the sands near Redcar, and two were seen fishing near Redcar Pier on the 24th.—T. H. NELSON (Redcar).

EXTRAORDINARY ASSEMBLAGE OF SHORT-EARED OWLS.—On the 6th November, when shooting at the Roman encampment, commonly called the "Black Beacon," near Cromer, I saw an extraordinary number of Short-eared Owls. First a pair got up, and then a single bird or two, but about 2.30, out of a small valley on the heath, where there are some young larch trees, nine rose, and afterwards, from another part of the heath, where there are a great many thriving young Scotch firs from five to ten feet high, about twenty got up, not all at once, but by twos and threes in rapid succession, so that there was no doubt of their being all members of one flock. We certainly did not see less than forty in the course of the afternoon, allowing for seeing some twice over; and I think, though it was impossible to count them, that—reckoning the single birds—there were nearer fifty. It is very common at this time of year to see one or two, but I never saw anything approaching this before.—J. H. GURNEY, JUN. (Northrepps, Norwich).

SKUAS AND CORMORANT IN OXFORDSHIRE.—A fine specimen of Richardson's Skua was killed at Milcombe, in this county, on October 15th; and about the same time a Common Skua, at Eydon, Northamptonshire, about ten miles from here. On November 7th a Cormorant was procured, shot at Clattercut Reservoir.—O. V. APLIN (Bodicote, near Banbury).

HEN HARRIER AT SCILLY.—One of the finest examples of this beautiful species, in the character of the female or ringtail plumage, was sent over from the islands on October 30th. Its length, which I carefully ascertained, was twenty-two inches, and the whole of the under parts, including the thighs, were of an uniform cinnamon colour, without blotch or streak, giving the bird at first sight, when lying on its back, the appearance of the immature Montagu's Harrier. The last-named bird has been much more frequently met with at Scilly than the Hen Harrier, and it may be said that the former is far more abundant generally in Cornwall, at least in the Land's End and Lizard districts.—EDWARD HEARLE RODD (Penzance).

A WHITE PUFFIN.—Early in June last an almost white specimen of the Puffin was picked up alive on the sands between Redcar and Marske, and is now in the possession of a gentleman at Redcar. The bill is in the winter stage, and, with the exception of a few cinnamon-coloured feathers on the back, the whole of the plumage is white.—T. H. NELSON (Redcar).

CAPTURE OF A TORPEDO, OR CRAMP RAY, AT BEER, DEVON.—Mr. S. Good, photographer, of Seaton, to whom I have been indebted for interesting specimens on several previous occasions, kindly sent me a female specimen of the Torpedo, or Cramp Ray, which was taken in a trawl-net by some Beer fishermen on the 28th October. It measured 2 feet 9½ inches in length, and 1 foot 8¼ inches across the back at the widest part. The spiracles were devoid of fringes, and the first dorsal fin was situated nearly entirely behind the roots of the ventrals. The outline of the head in front was straight, being only slightly concave in the centre. The colour was a uniform dark brown above, and pure white on the underside. There were no traces of spots. It is doubtless *Torpedo habetans*, Lowe. I examined the electrical organs, and the appearance of the peculiar gelatinous substance of which they are composed strongly reminded me of the egg-clusters of the Squid sometimes thrown up on our shores. I did not perceive that the cells were hexagonal in shape. They more resembled in form the cells in the pulp of a dry-fleshed orange. This fish is so rare on this part of the coast, none having occurred, it is said, for at least thirty years, that its power of giving an electrical shock appears to have been unknown to its captors. At all events the first of them who laid hold of it received so severe a practical illustration of this part in its Natural History that his comrades thought he would have jumped overboard. The specimen has been preserved for this Museum; but, at the best, fishes of this family have but a sorry appearance when stuffed.—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

RARE FISH ON THE NORFOLK AND SUFFOLK COAST.—Mr. Gurney has recorded (p. 312) the occurrence of a Sword-fish, captured at Sherringham

near Cromer, in July last. This fish was taken to Yarmouth, and exhibited on the Race-course there; but, in consequence of some difficulty with the authorities, it was sold for six shillings, and what eventually became of it I could not learn. On the 28th September a Thresher Shark, taken in the herring-nets off Lowestoft, was brought on shore there, and immediately forwarded by rail to London. It was seen by my informant, Mr. Massingham, the harbourmaster of Lowestoft. A newspaper paragraph states that on Saturday, October 25th, a "barking" (*sic*) Shark was exhibited at Southwold by a fisherman named Hudd, who had captured it in his nets. It was said to weigh three-quarters of a ton, and measured $14\frac{1}{2}$ feet in length. The man expressed his intention to forward it to a "London museum." The Basking Shark has more than once been found entangled in the herring-nets by our fishermen.—T. SOUTHWELL (Norwich).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 6, 1879.—Prof. ALLMAN, F.R.S., President, in the chair.

In opening the Session of 1879-80, the President made a few remarks on the demise of Mr. W. Wilson Saunders and Mr. John Miers, two old and respected Fellows of the Society, whose scientific labours in connection therewith have been highly appreciated.

Mr. W. H. Twelvetrees, of Orenburg, Russia, was elected a Fellow of the Society.

Dr. Francis Day read a paper "On the Instincts and Emotions in Fish." He observed that during the last few years, while biologists have given attention to the faculties of many animals, those of fish have received but scant attention; and even of late, Cuvier's estimate of their total want of intelligence is quoted as authentic by English authorities. He endeavoured to combat this notion, and adduced a great many examples, both from his own experience and the data afforded by other writers, as evidence of what may be regarded as emotions and affections. He pointed out that they are both monogamous and polygamous, construct peculiar nests, occasionally carry about their eggs; protect and defend their young with great vigour; occasionally exhibit affection for one another; can be tamed and recognise human beings; manifest fear, anger, hatred and revenge; have peculiar modes of defence; in certain instances utter sounds; hide themselves when danger warns, or betake themselves for protection to the bodies of other animals; even leave the water for food, &c.; and lastly, certain species, even of different families, form combinations for attack and defence. At the same time he considered that it could hardly be expected that these, the lowest form of vertebrated life, have their faculties so acutely developed as in the higher races. He felt justified, however, in claiming for some, at least, of

the finny tribe that they have attachments, whether in the form of conjugal feeling, paternal and maternal affections, or even of platonic friendship.

Some botanical photographs were exhibited, and two interesting papers read, *viz.* :—"On the Coffee-leaf Disease," by Mr. D. Morris, and "On the Origin of the (so-called) Scorpioid Cyme," by the Rev. George Henslow. The abstruse character of the latter paper was rendered comprehensible by some ingeniously contrived apparatus elucidating the changes in spiral vegetation.—J. MURIE.

NOTICES OF NEW BOOKS.

The Amateur Poacher. By the Author of 'The Gamekeeper at Home,' and 'Wild Life in a Southern County.' Post 8vo. London: Smith, Elder & Co. 1879.

THE author of this book, who gives no clue to his identity beyond the initials "R. J." at the foot of his preface, is already known to our readers by reputation, his two former books having been noticed in the pages of this journal. In the present volume he gives us an insight into some of the many devices which human ingenuity has contrived for capturing wild animals, more especially those which come under the denomination of "game." We are taught how to set a rabbit-snare, how to outwit a hare, how to secure a pheasant with the least trouble and least noise, how to take a pike with a wire, and other similar accomplishments, all of which usually come under the definition of "poaching." These inventions, improved upon at various times and in various ways, must have originally been suggested by close observation of the habits of the animals whose destruction they were designed to compass; and our author, not content with a mere description of each trap or snare, points out in most cases the peculiar trait in the animal's character which has had to be counteracted by the superior intelligence of man in the struggle of instinct *versus* reason. He borrows no facts from other authors, but narrates the results of his personal observation as jotted down by him during his country rambles. Nor are his remarks confined to game: we find some pretty glimpses of bird-life. Here is an observation anent Yellowhammers:—

"The female Yellowhammers, whose hues are not so brilliant as those of the male birds, seem as winter approaches to flock together, and roam

the hedges and stubble-fields in beevies. Where loads of corn have passed through gates the bushes often catch some straws, and the tops of the gate-posts, being decayed and ragged, hold others. These are neglected while the seeds among the stubble, the charlock, and the autumn dandelion are plentiful, and while the ears left by the gleaners may still be found. But in the shadowless winter days, hard and cold, each scattered straw is sought for. A few days before the New Year (1879) opened I saw a Yellowhammer attacking, in a very ingenious manner, a straw that hung pendant, the ear downwards, from the post of a windy gateway. She fluttered up from the ground, clung to the ear, and outspread her wings just as the breeze does on a paper kite, and there the bird remained supported without an effort while the ear was picked. Now and then the balance was lost, but she was soon up again, and again used the wind to maintain her position. The brilliant cock birds return in the early spring, or at least appear to do so, for the habits of birds are sometimes quite local."

The professional poacher's account of himself, given in the vernacular, furnishes a good illustration of the author's powers of observation, combined with the rare merit which he possesses of describing accurately without exaggerating.

We may take it that the present volume is not designed to teach the art of poaching, but, by exposing the machinations of the poacher, to enable intelligent keepers, under their master's direction, to outwit that arch enemy of the game-preserver.

The Natural History of Selborne, and the Naturalist's Calendar.

By the Rev. GILBERT WHITE, A.M. A New Edition.

Edited, with Notes, by G. CHRISTOPHER DAVIES, Author of
'The Swan and her Crew,' &c. Post 8vo, illustrated.

London: Warne & Co. 1879.

ALTHOUGH we are unable to understand how any necessity can possibly have arisen for another edition of White's 'Selborne,' three different editions having appeared within the last three years, we are willing to admit that any attempt to increase the popularity of this already popular book is worthy of commendation, provided the text is left as White wrote it, and is not overloaded with notes which, upon examination, are found to be neither useful nor relevant. In the present instance the editor's chief merit seems to lie in the brevity of his notes; we should like to have added also in the accuracy of them.

With the commentaries of so many previous editors to fall back upon, there was less excuse for tripping than there otherwise might have been, and we fear that Mr. Davies has relied too strongly upon his own acquaintance, or rather want of acquaintance, with some of the subjects dealt with in the text. A few instances will suffice. In a note to White's observation that "a little yellow bird still [*i. e.*, in August] continues to make a sibilous shivering noise in the tops of tall woods" [Letter X. to Pennant], Mr. Davies suggests that the Grasshopper Warbler is intended. But the Grasshopper Warbler is not a little yellow bird, nor is it in the habit of frequenting the tops of tall woods. White obviously referred to the Wood Wren. At page 41 Mr. Davies states that there are about twenty species of British Bats. Fourteen is the number of species included by Mr. Bell in the last edition of his 'British Quadrupeds,' and one or two of these have occurred so very seldom as scarcely to entitle them to be termed indigenous. The supposition that there is only one species of Newt in this country would not have been hazarded had Mr. Davies referred to Bell's 'British Reptiles,' or the more recent work with the same title by Mr. M. C. Cooke. In 'The Zoologist' for February last (p. 61), will be found a note which establishes the existence of three species of Newt in the British Islands. It was previously supposed that there were four. The statement that the Pied and Grey Wagtails do not migrate (p. 112), is not in accordance with what has been observed of these birds, although we have not space here to enter upon proofs.

We cannot say much for the engravings. The best are copies (electros, we presume), of Wolf's illustrations to Johns' 'British Birds in their Haunts,' engraved by Whymper. These were charming when they first appeared, but as they have been published some seventeen years, and have been used over and over again in different books, many of them are much worn, and the impressions consequently are not satisfactory. Of the rest, some, as, for instance, the Weasel (p. 51), and the Shrike (p. 108), are mere caricatures. The editor, we feel sure, can have had no hand in selecting the illustrations, or he would never have allowed a poor representation of a Fallow-deer to do duty for a Red-deer (p. 20), or have put forth the portrait of a Common Curlew as a faithful likeness of the Stone Curlew, or Thick-knee (p. 55). Nor would he have given us (as on p. 86), a picture of the

Brambling to illustrate White's remarks on the Snow Bunting. Why figures of such birds as the Knot and the Puffin, of which no mention is made by White, should be introduced (pp. 69, 71), we cannot say.

We make these remarks in no spirit of unfriendly criticism, but rather in that spirit of *accuracy* which especially characterises the writings of Gilbert White, and which all writers on Natural History would do well to emulate.

Ostriches and Ostrich Farming. By JULIUS DE MOSENTHAL and JAMES EDMUND HARTING. Second Edition. 8vo, with numerous illustrations. London: Trübner & Co. 1879.

THE first edition of this work appeared in 1876, and was noticed in 'The Zoologist' for that year at page 5173. The favourable reception accorded to it both at home and abroad, and the marked recognition of its utility by the French Société d'Acclimatation, which awarded the authors *une médaille de la première classe*, encouraged the hope that a second edition might be as favourably received. This new issue contains a *resumé* of such fresh information of importance as has been received in connection with the subject since the appearance of the first edition, including the report of the Committee appointed by the Chambre Syndicale of Paris to report on the best means of developing and encouraging Ostrich-farming in Algeria and other French colonies. The present aspect of Ostrich-farming in South Africa is discussed, and the current prices of birds of all ages given from recent quotations. Two new models of incubators are described, and some suggestions are offered on the nature and treatment of certain diseases to which these giant birds are found to be liable in confinement.

The full-page illustrations by Mr. T. W. Wood, of the Ostrich, Rhea, Emu, Ceram Cassowary, and Apteryx, which were drawn expressly for this work from living birds in the Zoological Society's Gardens, Regent's Park, are very characteristic, and, together with the numerous other woodcuts with which the book is interspersed, render the volume as complete a treatise on the subject as it was possible to make it.



